Table 5.7 CONFIG Items and Options (Cont.)

NOTE: Underlined options are the factory defaults.

CONFIG Items	Options	Description
<DQ-MODE >		Selection for draft quality printing mode
	MODE1	Prints in 720CPS printing mode.
	MODE2	Prints in 540CPS printing mode.
<==END==>		(LED only) Indicates the end of the CONFIG item list. Press the ▼ button to print the first item, which is <TEAROFF>. Press the ▲ button to print the previous item. Press the ONLINE button to reprint the <<FUNCTION>> menu.

HEAD GAP ADJUSTMENT ITEMS AND OPTIONS

The GAP-ADJ function adjusts the gap between the print head and the paper. The automatic paper thickness control (APTC) feature is built in this printer. If you adjust the gap manually or fix the gap, change the option of GAP-ADJ function.

For the procedure how to change the options refer to the section **Setup Mode Example** earlier in this chapter.

Table 5.8 GAP-ADJ Items and Options

NOTE: Underlined options are the factory defaults.

GAP-ADJ Items	Options	Description
<AMOUNT>		Specifies the print head gap.
	AUTO	The print head gap is set automatically.
	MANUAL	Turn the paper thickness dial (indicator) manually.
<==END==>		(LED only) Indicates the end of the GAP-ADJ item list. Press the ▼ button to print the first item, which is <AMOUNT>. Press the ▲ button to print the previous item. Press the ONLINE button to reprint the <<FUNCTION>> menu.

EXITING AND SAVING

This section describes how to exit setup mode and save any changes you made:

To exit setup mode immediately, select the SAVE & END (for LED type) SAVE&EXIT (for LCD type) function.

Any settings changed while in setup mode are saved as the new power-on defaults for the printer. The new defaults remain active until you change them again.

NOTE (LED only)

The only way to exit setup mode without saving your changes is to turn off the printer. When you turn the printer back on, the previous default settings are used.

Procedure (for LED type)

To exit setup mode and save your changes using SAVE/END, proceed as follows:

1. **Print the <<FUNCTION>> menu.**

   The <<FUNCTION>> menu should be the last printed line on the page. If the menu is not printed, press the ONLINE button to print the menu. The <<FUNCTION>> menu is shown below:

```
<< FUNCTION >>
SAVE&END MENU1    MENU2    HARDWRE  ADJUST   CONFIG   GAP-ADJ  DEFAULT  LIST     SELF-TST
HEX-DUMP V-ALMNT  INITIAL
```

2. **Select the SAVE/END function.**

   Make sure that the cursor on the left edge of the aluminum print guide is positioned under SAVE & END. Press the ▲ button or the ▼ button to select SAVE & END. The printer exits setup mode and returns online (the ONLINE indicator lights green). Any changes you made while in setup mode are saved.

Procedure (for LCD type)

To exit setup mode and save or cancel your changes using SAVE/EXIT function, proceed as follows:

1. **Push SAVE/EXIT button.**

   Push SAVE/EXIT button, then "▼:SAVE ▲:CANCEL" is displayed on LCD PANEL

2. **Push ▼or▲ button.**

   Push ▼ to save changing.

   Push ▲ to cancel changing.

RESETTING DEFAULTS

This section describes how to reset the printer's power-on defaults, all of the factory defaults, or the factory defaults only for MENU1 and MENU2.

Resetting Power-On Defaults

Power-on defaults are the settings saved in the printer's permanent memory. The defaults are enabled whenever you turn the printer on.

The only (LED type) way to reset the power-on defaults is to turn the printer off and then on again. This method is useful if you have made changes in setup mode that you do not want to save. LCD type, save or cancel options are available on exit menu.

Resetting Factory Defaults

Factory defaults are those settings preselected at the factory. For a list of the printer's factory defaults, see the section Printing a List of Selected Options earlier in this chapter. To reset the factory defaults for all functions, proceed as follows:

1. Turn off the printer.
2. While pressing the LOAD and, TEAR OFF buttons, turn on the printer. Continue to press the two buttons until the printer beeps.

   The factory defaults are now reset.

   Another available method is to select INITIAL in SETUP mode. The method of making settings is the same as the method for selecting DEFAULT on the next page, except that INITIAL must be selected instead of DEFAULT.

Resetting Factory Defaults in MENU1 and MENU2

This method resets factory defaults for MENU1 and MENU2 options, listed in Table 5.4, but does not reset the printer hardware, print position adjustment, and configuration options. To reset the factory defaults in MENU1 and MENU2, select DEFAULT in SETUP mode. Detail of method as follows:

1. **Enter setup mode (LED type).**

   Press the AUTO GAP button and the HI IMPACT button simultaneously until the printer beeps. Wait for the printer to stop printing and check that the following <<FUNCTION>> menu is printed:

```
<< FUNCTION >>
SAVE&END MENU1    MENU2    HARDWRE  ADJUST   CONFIG   GAP-ADJ  DEFAULT  LIST     SELF-TST
HEX-DUMP V-ALMNT  INITIAL
```

2. **Select the DEFAULT function (LED type).**

   Repeatedly press the "TEAR OFF" or "LOAD" button to position the cursor on the left edge of the aluminum print guide on DEFAULT. Press the ▲ button or the ▼ button to select the DEFAULT function. The printer reprints the <<FUNCTION>> menu. The default values in MENU1 and MENU2 are now reset (not saved yet).

3. **Save reset values (LED type).**

   To exit setup mode and save the new defaults, make sure that the cursor on the left edge of the aluminum print guide are positioned on SAVE & END, then press the ▲ MICRO button or the ▼ MICRO button.

1. **Enter setup mode (LCD type).**

   Press the SETUP button at offline state. Check that the "SETUP MODE" is displayed on LCD panel.

2. **Select the DEFAULT function (LCD type).**

   Repeatedly press the "◀" or "▶" button to display "SUB FUNCTION". And then press the"▼" button to move lower layer. And then repeatedly press the "◀" or "▶" button to display "DEFAULT". And then press the "SELECT" button to reset the default values in MENU1 and MENU2 (not saved yet).

3. **Save reset values (LED type).**

   Exit setup mode, saving the factory defaults.

   Push SAVE/EXIT button. Check that "▼:SAVE ▲:CANCEL" is displayed on LCD panel. Then press the"▼" button.

USING THE DIAGNOSTIC FUNCTIONS

This section describes how to use the following diagnostic functions:

- SELF-TST
- HEX-DUMP
- V-ALMNT

These functions are used for checking print quality and diagnosing printer problems. HEX-DUMP also provides useful information for programmers.

Printing the Self-Test

The SELF-TST function prints test pages to check how the printer operates independently of your computer. The self-test does not check the interface between the computer and the printer.

The self-test prints the printer's firmware version, its resident emulations, and all of the characters available in the currently selected character set.

If the DPL24C PLUS emulation is selected for MENU1, the self-test is printed using the settings currently assigned to MENU1.

Procedure

This procedure assumes that you are in setup mode. To print the selftest, make sure that continuous forms paper is loaded into the printer.

Then proceed as follows :

1. **Print the <<FUNCTION>> menu.(LED)**

   The <<FUNCTION>> menu should be the last printed line on the page. If the menu is not printed, press the ONLINE button to print the menu. If you are using the HEX-DUMP function, press the "TEAR OFF" or "LOAD" button instead of the ONLINE button to print the menu. The following <<FUNCTION>> menu is printed:

```
<< FUNCTION >>
SAVE&END MENU1    MENU2    HARDWRE  ADJUST   CONFIG   GAP-ADJ  DEFAULT  LIST     SELF-TST
HEX-DUMP V-ALMNT  INITIAL
```

2. **Select the SELF-TST function.(LED)**

   Repeatedly press the "TEAR OFF" or "LOAD" button to position the cursor on the left edge of the aluminum print guide on SELF-TST, and then press the "▲" button or the "▼" button. The printer selects SELF-TST and starts printing. A short help menu is printed at the top of the page, followed by the selftest. Note that the printer is not online during self-test printing.

1. **Move to TOP MENU of SETUP MODE.(LCD)**

   Press the "▲" button until "SETUPMODE" is displayed on LCD panel.

2. **Select the SELF-TST function.(LCD)**

   Repeatedly press the "◀" or "▶" button to display "SELFDIAGNOSTIC". And then press the"▼" button to move lower layer. And then repeatedly press the "◀" or "▶" button to display "SELF-TEST". And then press the "SELECT" button to start self-test printing. A short help menu is printed at the top of the page, followed by the selftest. Note that the printer is not online during self-test printing.

3. **Examine the self-test page.**

   A sample self-test page is shown in Chapter 2. To pause during self-test printing, press the "LOAD" button. To resume self-test printing, press the "LOAD" button again.

4. **Exit the SELF-TST function.**

   Exit the SELF-TST function in either of the following ways:

   - To exit SELF-TST and remain in setup mode, press the LF/FF button. The <<FUNCTION>> menu is then reprinted (LED type).
   - To exit SELF-TST and return online, press the ONLINE button. The printer permanently saves any changes made while in setup mode and returns online.

The self-test can also be started by turning off the printer, and then pressing the LF/FF button while turning the printer back on. As described in Chapter 2, this method is useful when you first set up the printer.

Printing Hex Dumps

The HEX-DUMP function prints data and commands in hexadecimal characters and abbreviated control codes. The IBM character set 2 is used for printing (see Appendix E). The HEX-DUMP function is useful for checking whether your computer is sending the correct commands to the printer and whether the printer is executing the commands correctly. It is also useful for debugging software programs.

Procedure

To print hex dumps, make sure that continuous forms paper is loaded into the printer. Then proceed as follows:

1. **Enter setup mode(LED).**

   Press the AUTO GAP button and the HI IMPACT button simultaneously until the printer beeps. Wait for the printer to stop printing and check that the following <<FUNCTION>> menu is printed:

2. **Select the HEX-DUMP function(LED).**

```
<< FUNCTION >>
SAVE&END MENU1    MENU2    HARDWRE  ADJUST   CONFIG   GAP-ADJ  DEFAULT  LIST     SELF-TST
HEX-DUMP V-ALMNT  INITIAL
```

   Repeatedly press the "TEAR OFF" or "LOAD" button to position the cursor on the left edge of the aluminum print guide on HEX-DUMP, then press the ▲ button or the ▼ button to select the HEX-DUMP function. The printer goes online and prints a header and a short help menu.

1. **Enter setup mode(LCD).**

   Press the SETUP button at offline state. Check that the "SETUP MODE" is displayed on LCD panel.

2. **Select the HEX-DUMP function(LCD).**

   Repeatedly press the "◀" or "▶" button to display "SELFDIAGNOSTIC". And then press the"▼" button to move lower layer. And then repeatedly press the "◀" or "▶" button to display "HEX-DUMP". And then press the "SELECT" button. The printer goes online and prints a header and a short help menu.

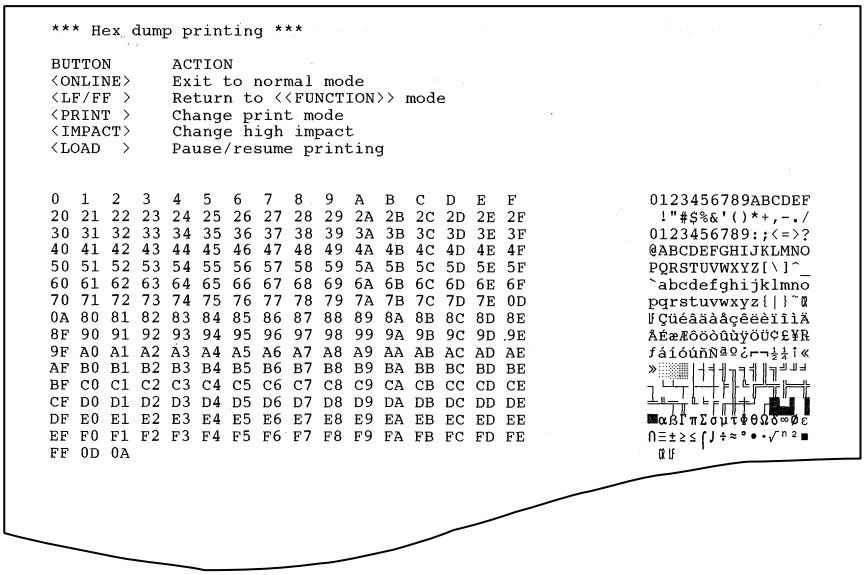
3. **Print the hex dump.**

   To start hex dump printing, send your file or program to the printer. The printer goes online and prints the hex dump.

   Press the LOAD button to pause during hex dump printing. To resume hex dump printing, press the "LOAD" button again.

NOTE

When hex dump printing stops, data that is less than one line printed yet, to print remaining data exit Hex-Dump mode(push LF/FF or ONLINE).



```
*** Hex dump printing ***

BUTTON      ACTION
<ONLINE>    Exit to normal mode
<LF/FF >    Return to <<FUNCTION>> mode
<PRINT >    Change print mode
<IMPACT>    Change high impact
<LOAD  >    Pause/resume printing


0  1  2  3  4  5  6  7  8  9  A  B  C  D  E  F          0123456789ABCDEF
20 21 22 23 24 25 26 27 28 29 2A 2B 2C 2D 2E 2F        !"#$%&'()*+,-./
30 31 32 33 34 35 36 37 38 39 3A 3B 3C 3D 3E 3F        0123456789:;<=>?
40 41 42 43 44 45 46 47 48 49 4A 4B 4C 4D 4E 4F        @ABCDEFGHIJKLMNO
50 51 52 53 54 55 56 57 58 59 5A 5B 5C 5D 5E 5F        PQRSTUVWXYZ[\]^_
60 61 62 63 64 65 66 67 68 69 6A 6B 6C 6D 6E 6F        `abcdefghijklmno
70 71 72 73 74 75 76 77 78 79 7A 7B 7C 7D 7E 0D        pqrstuvwxyz{|}~
0A 80 81 82 83 84 85 86 87 88 89 8A 8B 8C 8D 8E        ÇüéâäàåçêëèïîìÄ
8F 90 91 92 93 94 95 96 97 98 99 9A 9B 9C 9D 9E        ÉæÆôöòûùÿÖÜ¢£¥
9F A0 A1 A2 A3 A4 A5 A6 A7 A8 A9 AA AB AC AD AE        ƒáíóúñÑª º¿⌐¬½¼¡«
AF B0 B1 B2 B3 B4 B5 B6 B7 B8 B9 BA BB BC BD BE        »
BF C0 C1 C2 C3 C4 C5 C6 C7 C8 C9 CA CB CC CD CE
CF D0 D1 D2 D3 D4 D5 D6 D7 D8 D9 DA DB DC DD DE
DF E0 E1 E2 E3 E4 E5 E6 E7 E8 E9 EA EB EC ED EE        αßΓπΣσµτΦΘΩδ∞Øε
EF F0 F1 F2 F3 F4 F5 F6 F7 F8 F9 FA FB FC FD FE        ∩≡±≥≤⌠⌡÷≈°∙·√ⁿ²■
FF 0D 0A                                               
```

Sample hex dump

4. Exit the HEX-DUMP function.

Exit the HEX-DUMP function in either of the following ways:

- To remain in setup mode, press the LF/FF button. The <<FUNCTION>> menu is then reprinted (LED type). For details on other functions, see other sections in this chapter.
- To return to online normal mode, press the ONLINE button. If you press the ONLINE button while the hex dump is printing, the printer immediately switches to normal online mode, but data that was sent to the printer is printed in normal mode. At same time the printer permanently saves any changes made while in setup mode.

You can also enter hex dump mode, by turning off the printer, and then turning the printer back on while simultaneously pressing the ONLINE button and the LF/FF button until the printer beeps.

Checking Vertical Print Alignment (V-ALMNT)

The V-ALMNT function corrects the vertical character displacement that sometimes occurs with bidirectional printing. Characters printed from left to right are not aligned with characters printed from right to left as shown below:

```
This example shows how printing looks
when characters are vertically
misaligned. Note that the left
margin is not straight.
```

If you notice misaligned printing, use the following procedure to check and correct the vertical print alignment.

Procedure

Make sure that continuous forms paper is loaded in the printer. If possible, use forms at least 356 mm (14 inches) wide to avoid printing on the platen. However, you can also use letter or A4 size forms if you set the WIDTH option in MENU1 to 8 inches. See the section Changing MENU1 and MENU2 Items and Options for details. Then proceed as follows to check and correct vertical print alignment:

1. **Enter setup mode (LED).**

   Press the AUTO GAP button and the HI IMPACT button simultaneously until the printer beeps. Wait for the printer to stop printing and check that the following <<FUNCTION>> menu is printed:

```
<< FUNCTION >>
SAVE&END MENU1    MENU2    HARDWRE  ADJUST   CONFIG   GAP-ADJ  DEFAULT  LIST     SELF-TST
HEX-DUMP V-ALMNT  INITIAL
```

2. **Select the V-ALMNT function(LED).**

   Repeatedly press the "TEAR OFF" or "LOAD" button to position the cursor at V-ALMNT, then press the "▲" button or the "▼" button to select the V-ALMNT function. The printer prints the help menu then starts printing rows of parallel bars using letter quality speed.

1. **Enter setup mode(LCD).**

   Press the SETUP button at offline state. Check that the "SETUP MODE" is displayed on LCD panel.

2. **Select the V-ALNMNT function(LCD).**

   Repeatedly press the "◀" or "▶" button to display "SELFDIAGNOSTIC". And then press the"▼" button to move lower layer. And then repeatedly press the "◀" or "▶" button to display "V-ALNMNT". And then press the "SELECT" button. The printer prints the help menu then starts printing rows of parallel bars using letter quality speed.

3. Adjust the vertical print alignment at letter quality speed.

Examine the parallel bars. If the bars are aligned (not jagged), go to step 4. If the bars are offset to the left, repeatedly press the "▼" button until the bars are aligned. If the bars are offset to the right, repeatedly press the "▲" button until the bars are aligned. (In the following figure, the first line is assumed to be printed from left to right.)

Bars offset to the left Bars offset to the right

4. Adjust the vertical print alignment at correspondence speed.

Press the "TEAR OFF" button to switch from letter speed to correspondence speed.

Examine the parallel bars and adjust the vertical print alignment as described in step 3.

Press the HI IMPACT button to enter Hi Impact mode. Make similar adjustments.

5. Adjust the vertical print alignment at draft speed.

Press the "TEAR OFF" button to switch from correspondence speed to draft speed.

Examine the parallel bars and adjust the vertical print alignment as described in step 3.

Press the HI IMPACT button to enter Hi Impact mode. Make similar adjustments.

6. Adjust the vertical print alignment at high draft speed.

Press the "TEAR OFF" button to switch from draft speed to high draft speed.

Examine the parallel bars and adjust the vertical print alignment as described in step 3.

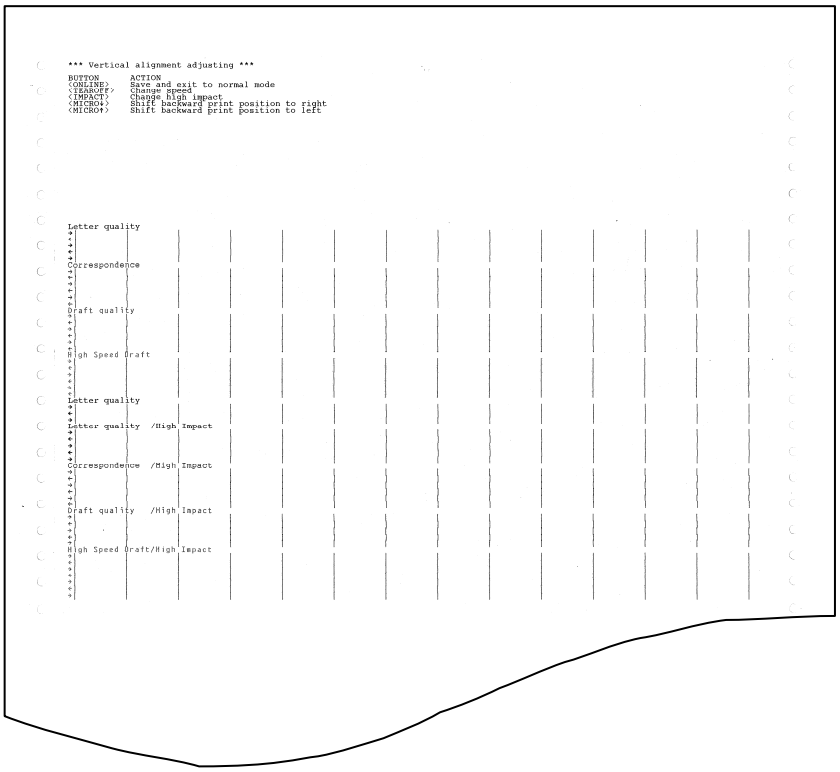
Press the HI IMPACT button to enter Hi Impact mode. Make similar adjustments.

7. Exit the V-ALMNT function.

Press the ONLINE button to exit the V-ALMNT function and save the new vertical alignment settings. The printer exits setup mode and returns online.

NOTE

To exit the V-ALMNT function, you must exit setup mode.



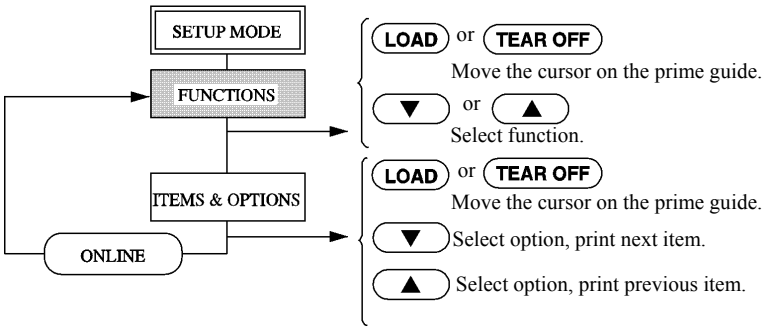
Correct vertical print alignment

SETUP MODE REFERENCE

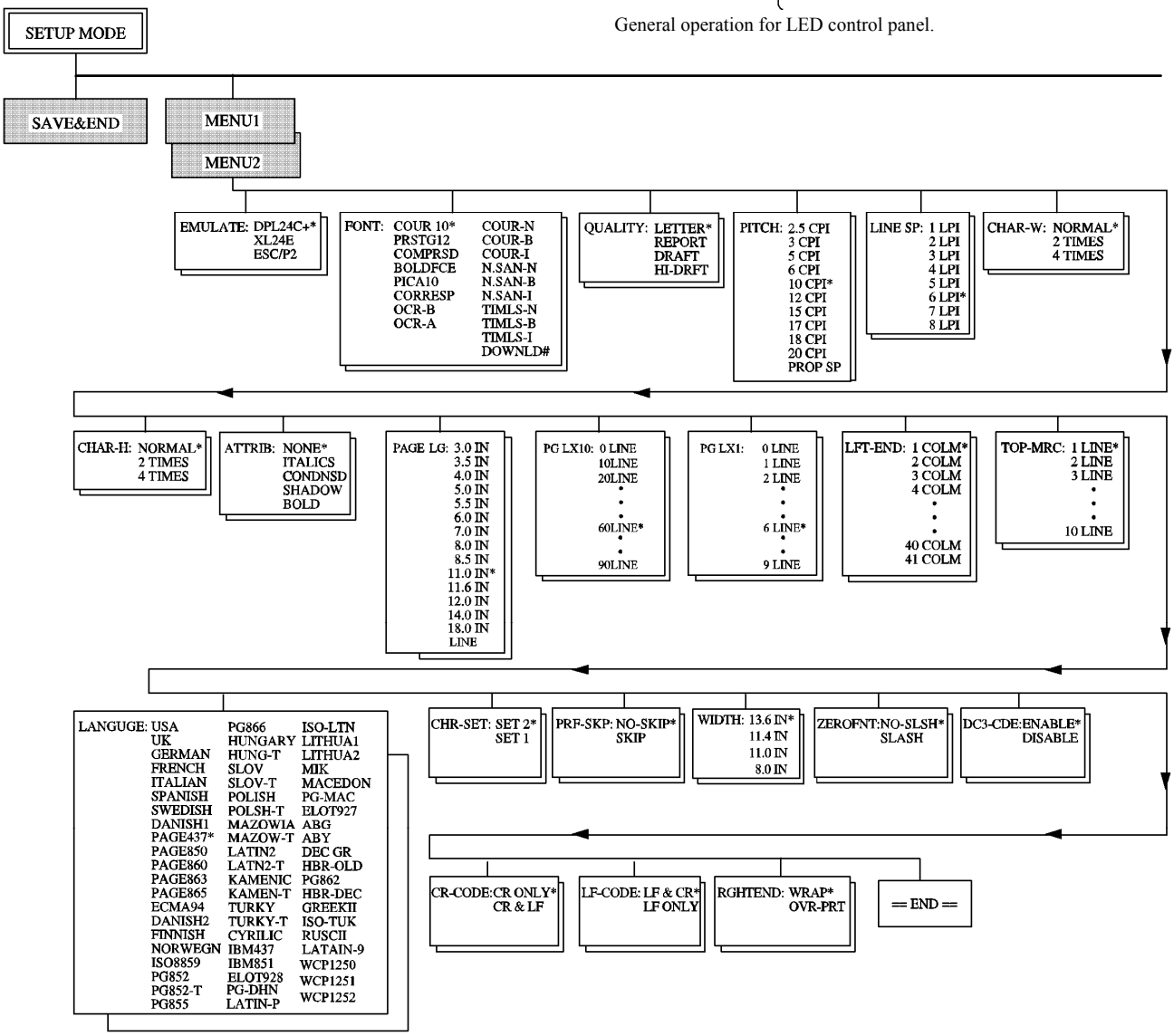
The following flowchart shows how setup mode is organized for the Fujitsu DPL24C PLUS emulation. Differences in the IBM Proprinter XL24E and Epson ESC/P2 emulations are summarized after the flowchart.

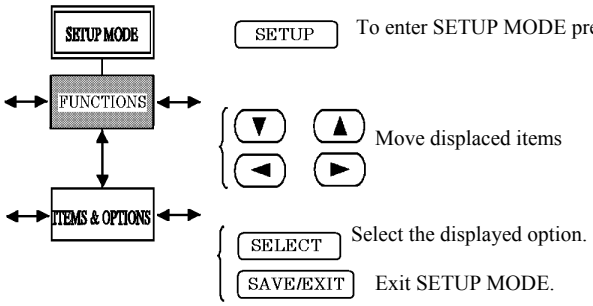
DPL24C PLUS ORGANIZATION

Note:
Asterisks (*) indicate default setting at shipment.

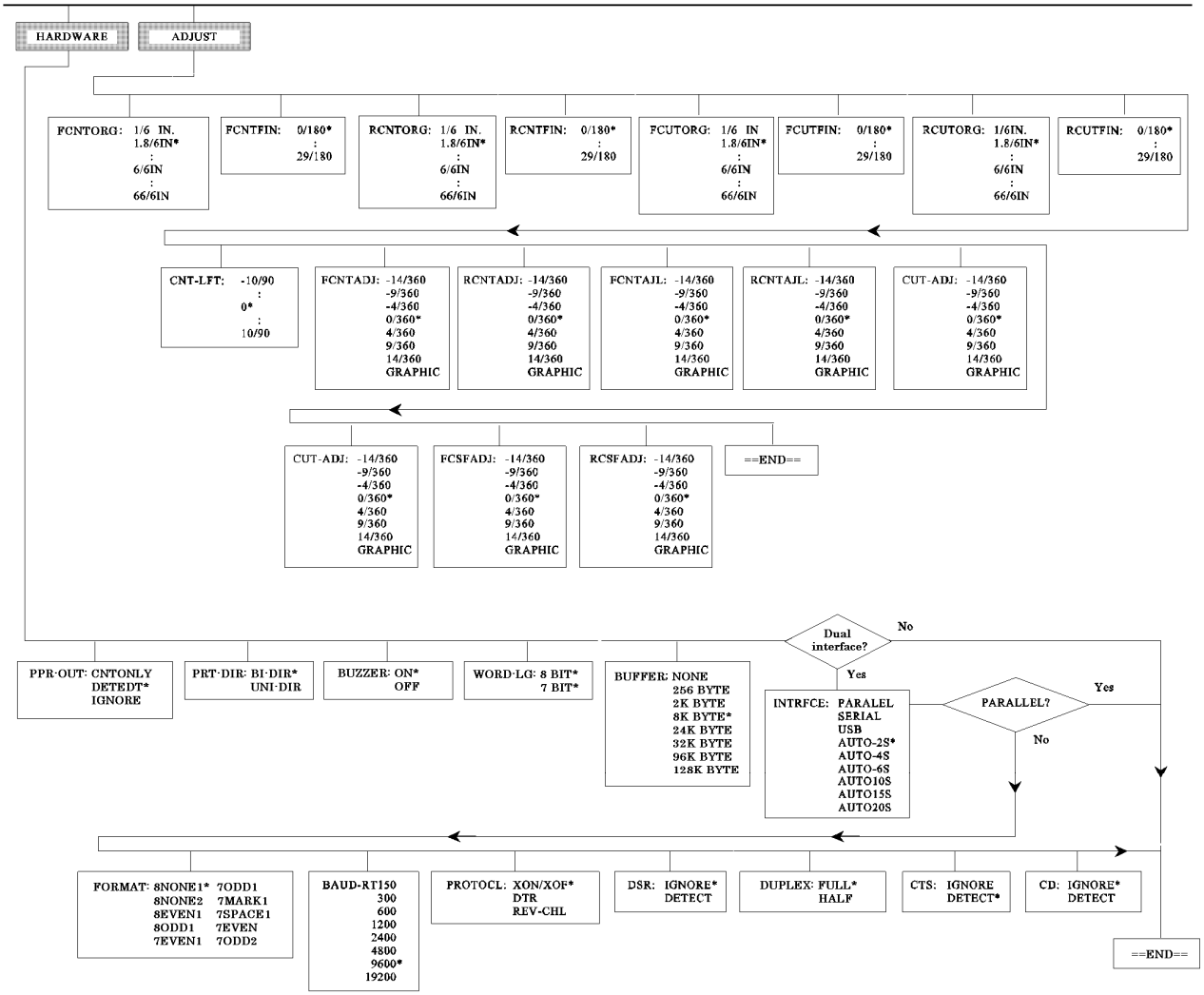


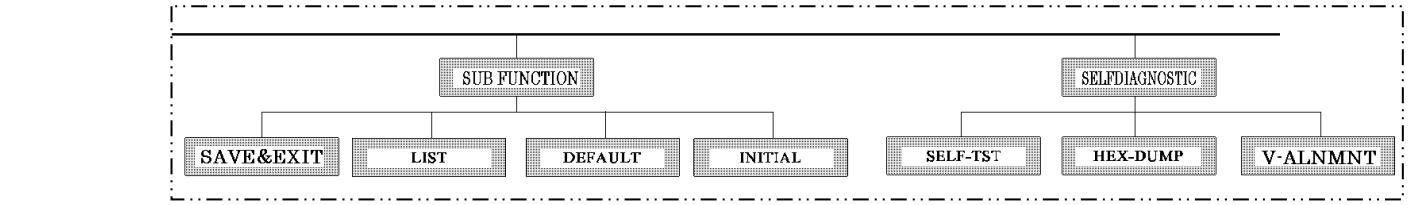
General operation for LED control panel.



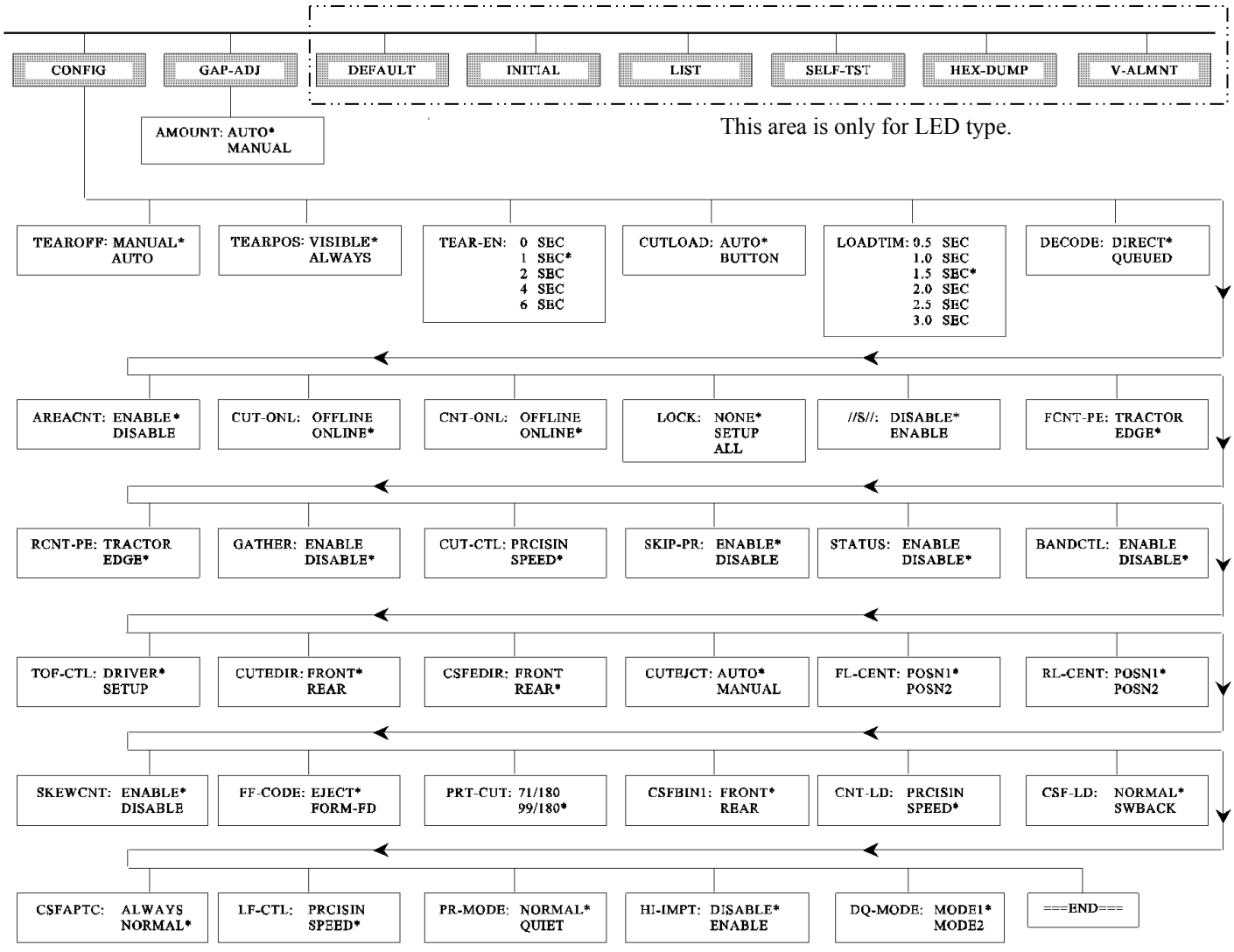


General operation for LCD control panel.





This area is only for LCD type instead of below area.

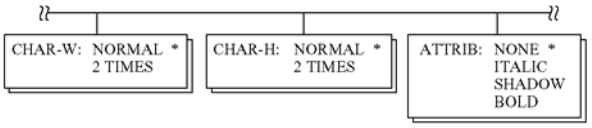


This area is only for LED type.

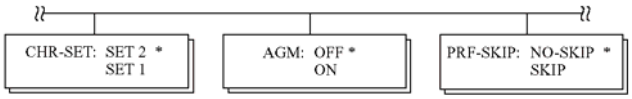
Differences in IBM Proprinter XL24E Emulation

In the IBM Proprinter XL24E emulation, MENU1 and MENU2 differ from the DPL24C PLUS emulation in the following ways:

- The following options are different:



- The AGM item is provided:



Differences in Epson ESC/P2 Emulation

In the Epson ESC/P2 emulation, MENU1 and MENU2 differ from the DPL24C PLUS emulation in the following ways:

- The ZEROFNT and LF-CODE items are not defined.
- The following options are different:

ONLINE SETUP MODE

The preceding sections describe offline setup mode. This section introduces online setup mode. The tedious task of setting up printer features one-by-one from the control panel and printing and checking the desired options on paper can be avoided by using online setup mode. In online setup mode, printer features are set via the computer rather than the printer control panel.

Put the printer in online setup mode, in either of the following two ways:

- Turn the printer off and then turn the printer back on while pressing the TEAR OFF button. Hold down the button until the printer beeps.
- Issue the printer command ESC e ONLINE. This command is valid in any emulation.

Send setup data from the computer in any of the following three ways:

- Enter setup data directly from the computer keyboard before starting your job. With MS-DOS, hold down the Ctrl key and type P. Data entered from the keyboard is sent directly to the printer. When data entry is complete, hold down the Ctrl key again and type P. This method is useful when just a few settings need to be changed.
- Use an editor program to prepare a setup data file and then send the file to the printer using a command before starting your job. With MS-DOS, use the COPY command. This method is useful when settings are used repeatedly.
- Write a program that enables interactive entry of setup data on the CRT screen. This method is the most useful of the three. This printer is provided with a floppy disk which contains this program called DLMENU. For DLMENU, see the last section of chapter 2.

To exit from online setup mode, send EXIT as the last setup data.

For details of setup data and its format, refer to the programmer's manual for each emulation.

6

MAINTENANCE

Your printer requires very little care. Occasional cleaning and replacement of the ribbon cartridge are all that is required.

Lubrication of the printer is usually not necessary.

If the print head carriage does not move smoothly back and forth, clean the printer as described in this chapter. If the problem continues, contact your dealer to determine whether lubrication might be needed.

CLEANING

The front cover, the rear stacker, and the soundproof cover or the paper table of the printer help protect against dust, dirt, and other contaminants. However, paper produces small particles that accumulate inside the printer.
This section explains how to clean and vacuum the printer and how to clean the platen.

It is easier to clean the printer when the front cover and the rear stacker are removed.

Cleaning and Vacuuming the Printer

WARNING

To avoid any possibility of injury, before cleaning the printer, turn off the power to both the printer and the computer, and unplug the printer.

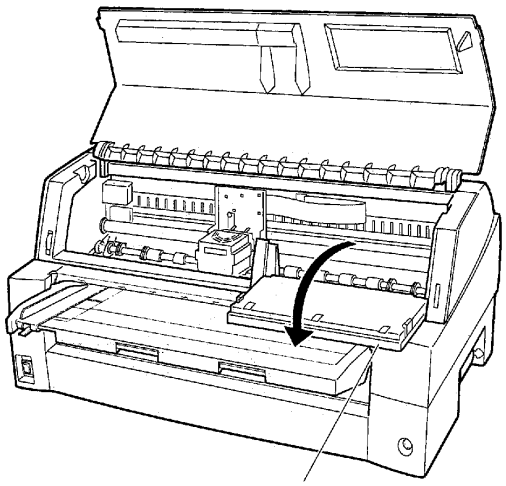
Use the following procedure to clean and vacuum the printer as required:

1. Remove any paper from the printer. Make sure that the power is off, and then disconnect the printer power cord.
2. Using a soft vacuum brush, vacuum the exterior of the printer. Be sure to vacuum the air vents at the front, left sides, and bottom of the printer. Also vacuum the paper table, rear stacker, and the cut sheet feeder.
3. Use a soft, damp cloth to wipe the exterior of the printer, including the cover, paper table, and rear stacker. A mild detergent may be used.

   CAUTION

   Do not use solvents, kerosene, or abrasive cleaning materials that may damage the printer.

4. Open the front cover of the printer and remove the ribbon cartridge. If necessary lay down control panel. Using a soft vacuum brush, gently vacuum the platen, print head carriage, and surrounding areas. You can easily slide the print head to the left or right when the power is off. Be careful not to press too hard on the flat ribbon cable that extends from the print head carriage.



Printer interior

5. Re-install the ribbon cartridge. Close the front cover.
6. Raise the soundproof cover or paper table and rear stacker. Vacuum the forms tractors and surrounding areas.

Cleaning the Platen

Clean the platen about once a month to remove excess ink. Use the platen cleaner recommended by your supplier and proceed as follows:

1. Apply a small amount of platen cleaner to a soft cloth. Avoid spilling platen cleaner inside the printer.

   CAUTION

   Do not use alcohol to clean the platen. Alcohol may cause the rubber to harden.

2. Place the cloth against the platen.
3. To dry the platen, place a dry cloth against the platen.

REPLACING THE RIBBON

There are two ways of replacing the ribbon. You can install a new ribbon cassette in the printer or refill the old ribbon cassette with new ribbon from a ribbon sub cassette. Appendix A lists order numbers for ribbon cassettes and ribbon sub cassettes. The following procedure is for ribbon cassettes. For ribbon sub cassettes, refer to the instructions shipped with the sub cassette.

To replace the ribbon cassette:

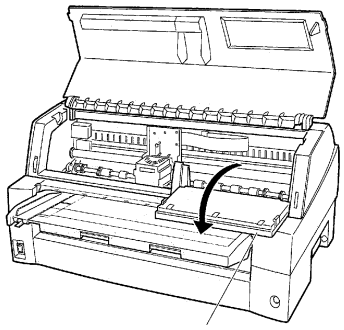
1. Turn off the printer.

   Note:

   If the power is turned off during or immediately after printing, turn on the power again. Verify that the print head has moved to the ribbon replacement position, and then turn off the power again.

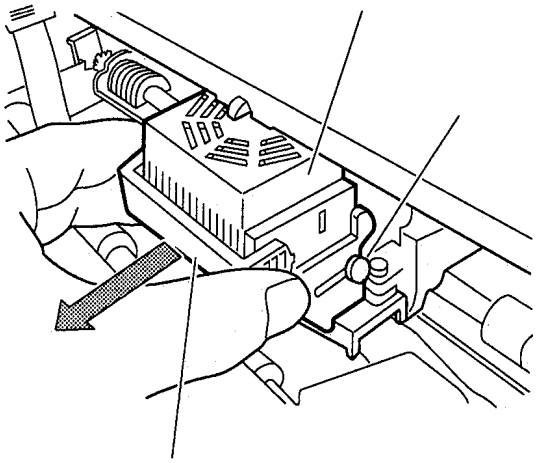
2. Open the front cover and control panel of the printer. Please make sure that the print head stops at the ribbon replacement position.

 (HOT)	**CAUTION <HOT>** **The print head and metal frame is hot during printing or immediately after printing. Do not touch them until it cools down.**



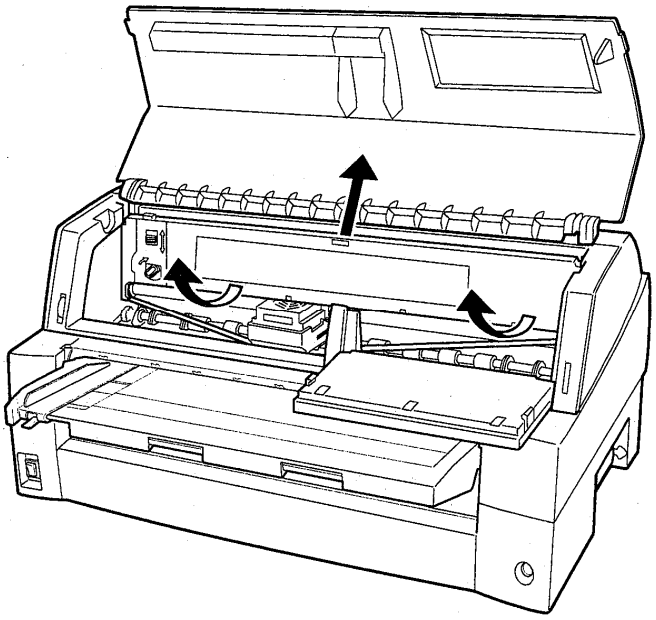
Preparing the printer to install the ribbon cartridge

3. Remove the ribbon guide.



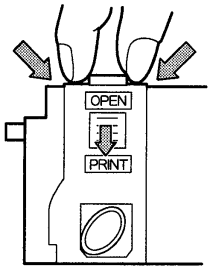
Removing the ribbon guide

4. To remove the ribbon cassette, pull the under side of ribbon cassette and carefully lift the cartridge out of the printer.



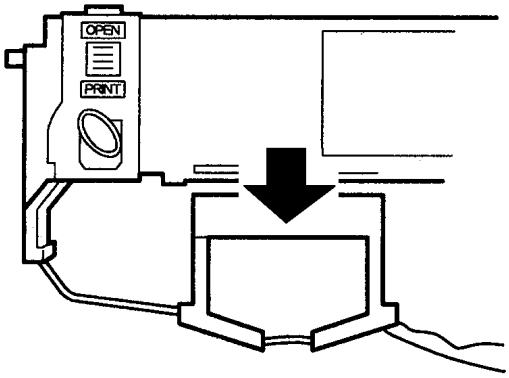
Removing the ribbon cassette

5. Remove the new ribbon cassette from its package. Push in the two ribbon release tabs. The tabs snap into the cassette and the ribbon feed mechanism engages.



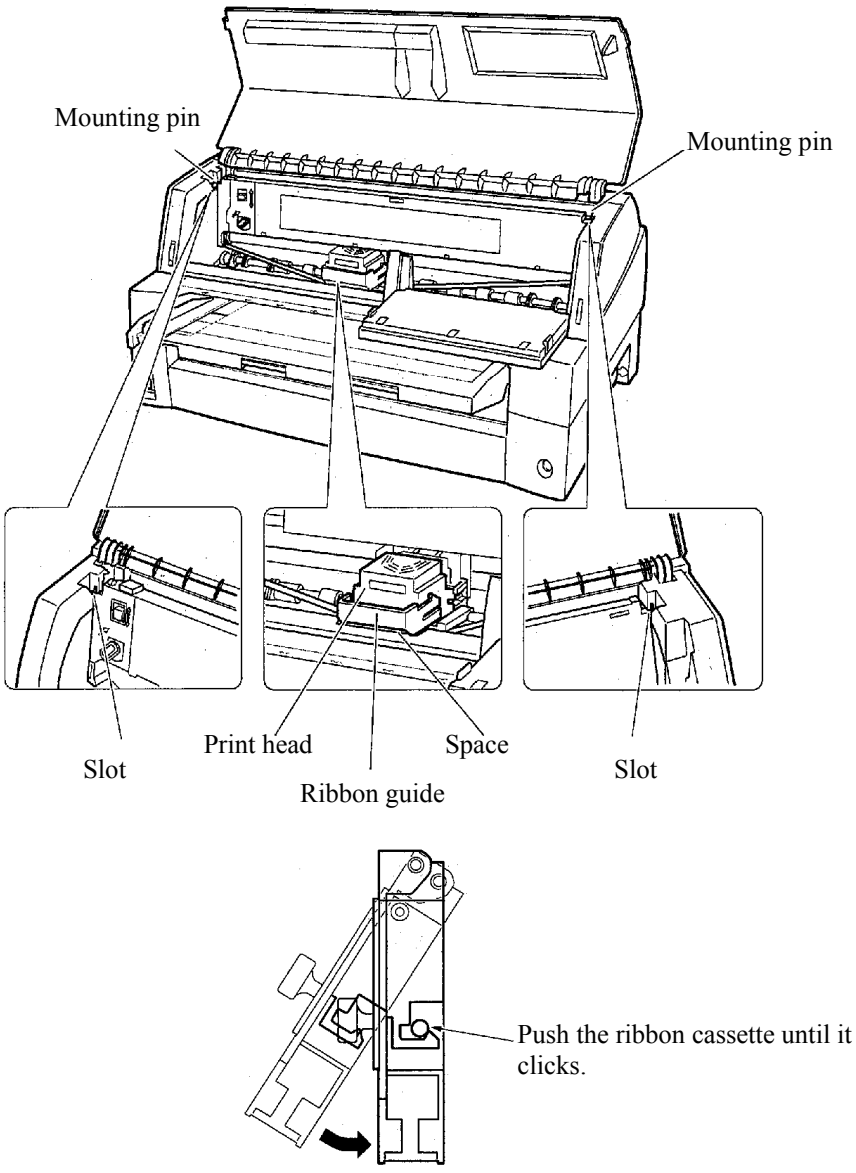
Preparing the ribbon cassette

6. Remove the ribbon guide (green part) from the ribbon cassette. Don't turn the ribbon feed knob before installation.



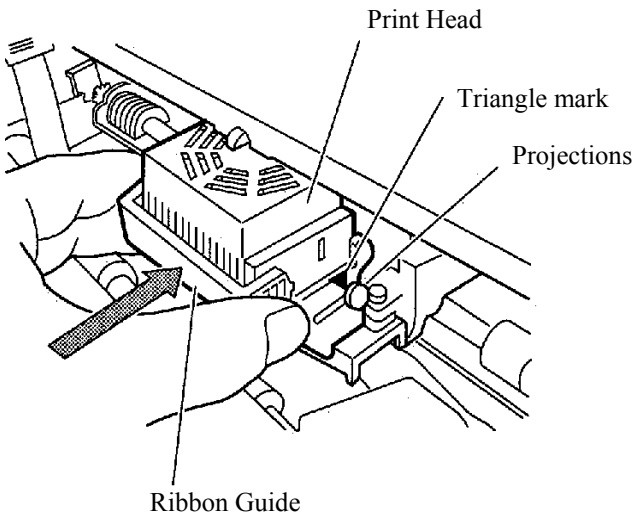
Preparing the ribbon cassette

7. Put the green ribbon guide into the space in front of print head. And then place the mounting pins (both side of ribbon cassette) on the slot of the printer cover. And then push the ribbon cassette so that the ribbon cassette is installed vertically.

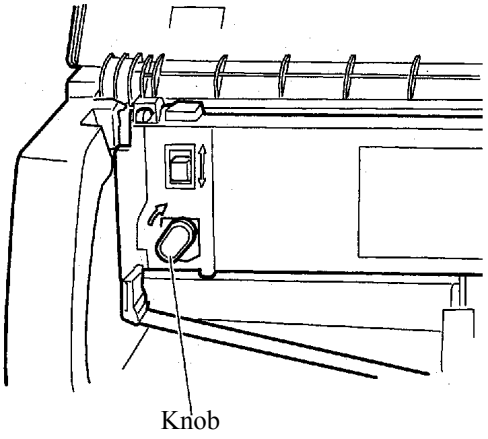


Installing the ribbon cassette

8. Attach the green ribbon guide on the print head.
   Please make sure that the ribbon slack lightly. (If the ribbon is strained, it will quirk when installation.)Push the green ribbon guide until the triangle mark "▼"meets the round projection of print head.



9. Turn the ribbon feed knob clockwise to take up any slack in the ribbon.



10. Return the control panel..

11. Close the front cover.

NOTE

A Fujitsu ribbon cassette is recommended. Don't use other cassettes. If other cassettes are used, operating problems or a damage of the print head may be caused.

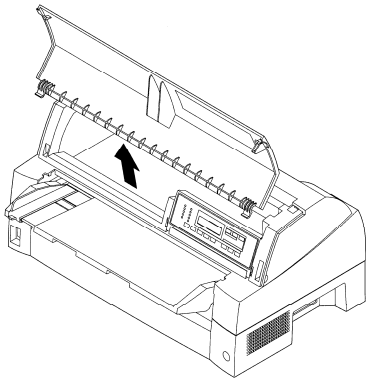
REPLACING THE PRINT HEAD

The print head is easy to replace.

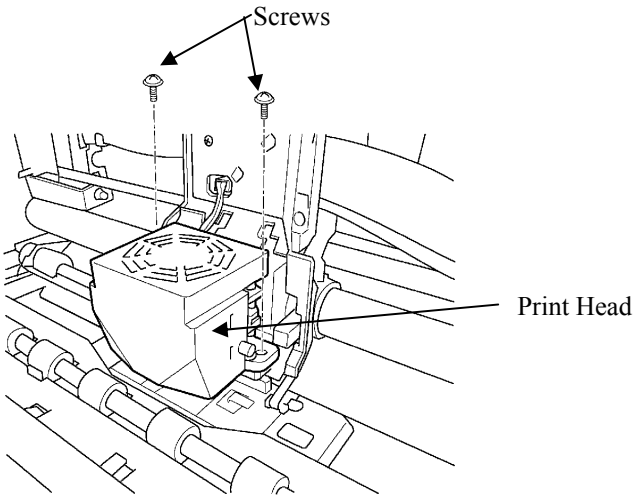
 (HOT)	**CAUTION <HOT>** **The print head and metal frame is hot during printing or immediately after printing. Do not touch them until it cools down.**

To remove the print head:

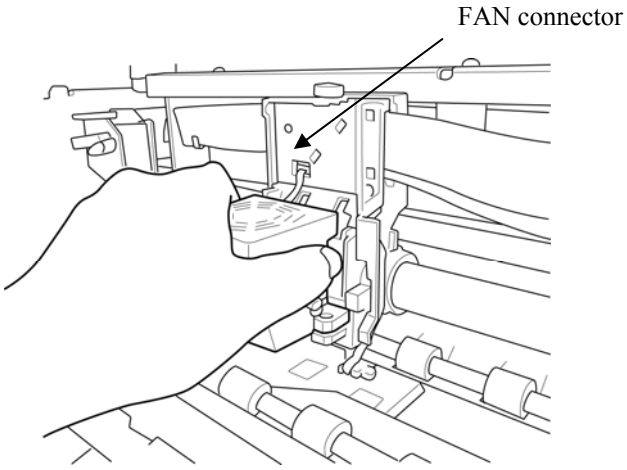
1. Turn off the printer.
2. Open the front cover of the printer and remove the ribbon cassette.
3. Please remove a front cover, during keeping the front cover aslant.

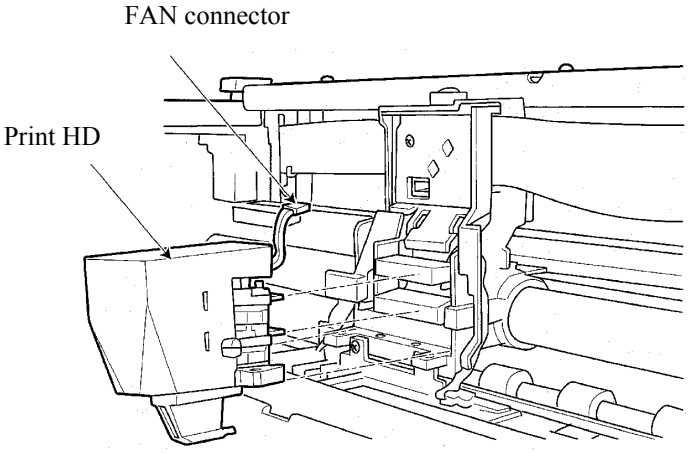


4. Remove two screws.



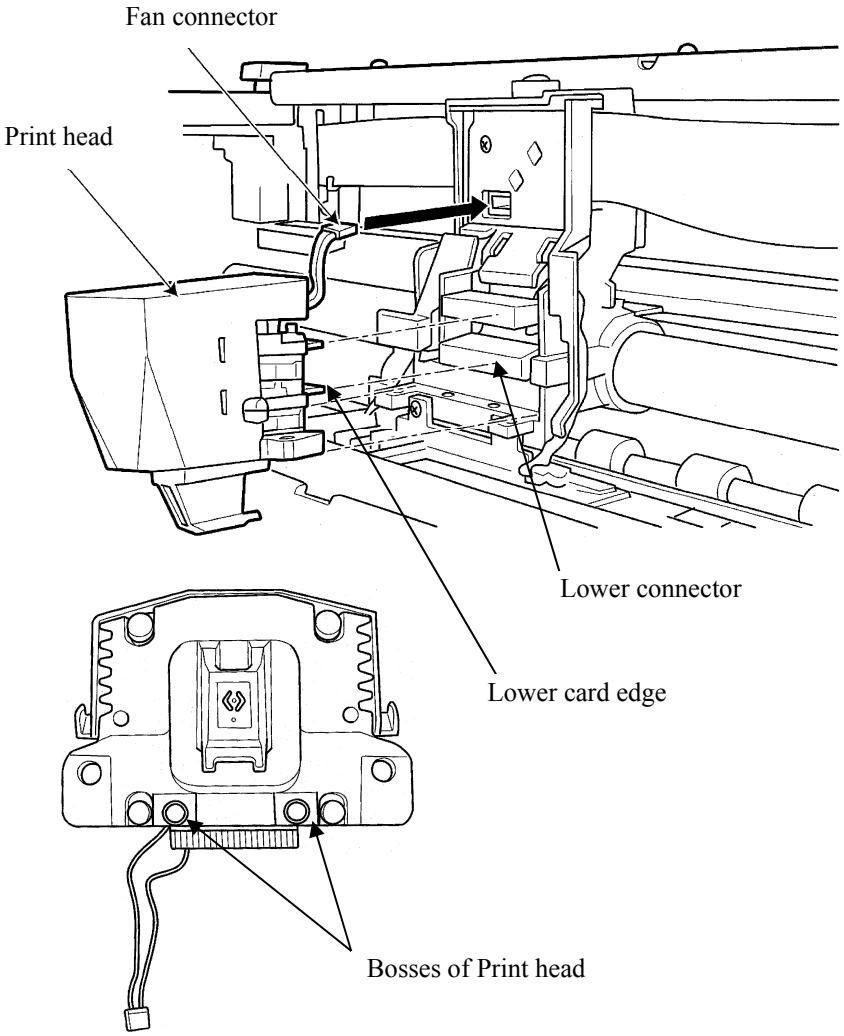
5. Remove the print head.





To install the print head:

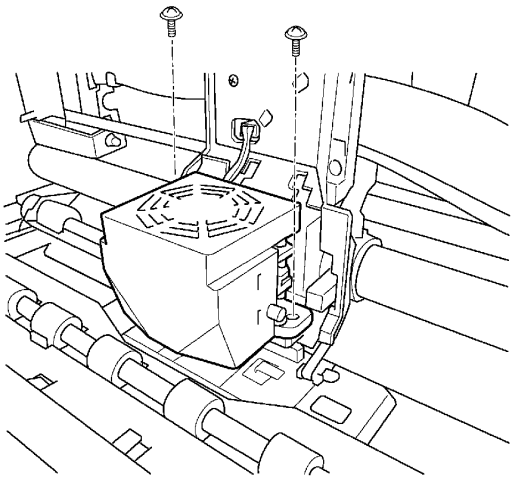
1. Connect the lower connector to the lower card edge of the print head.
2. Fit the upper card edge of the print head into the upper connector.
3. Fit the mounting bosses of the print head into the holes on the carriage.
4. Connect the fan connector.



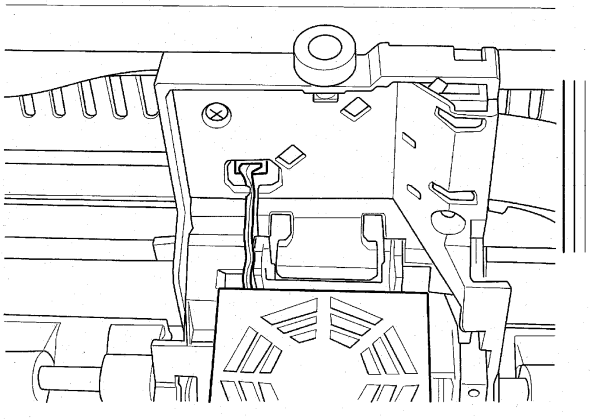
NOTE

Be carefully to insert the card edge straightly.

4. Fix the print head by two screws..



5. Insert the fan cables under black plastic part.

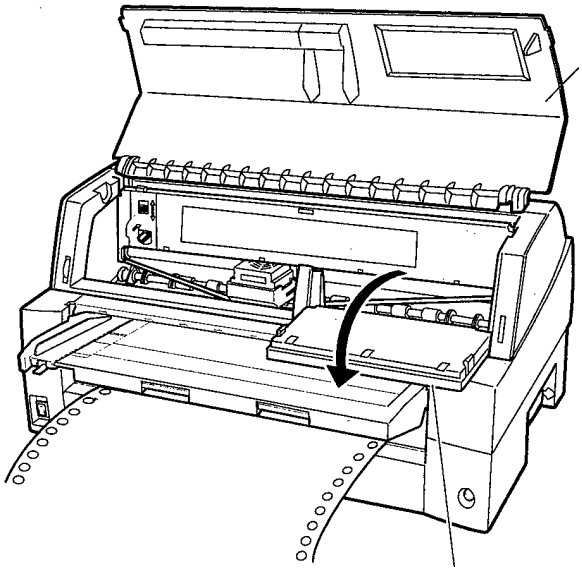


NOTE

If the FAN cable protrude from black plastic part. FAN cable may be damaged by ribbon feed mechanism on left side frame.

Opening and closing the control panel

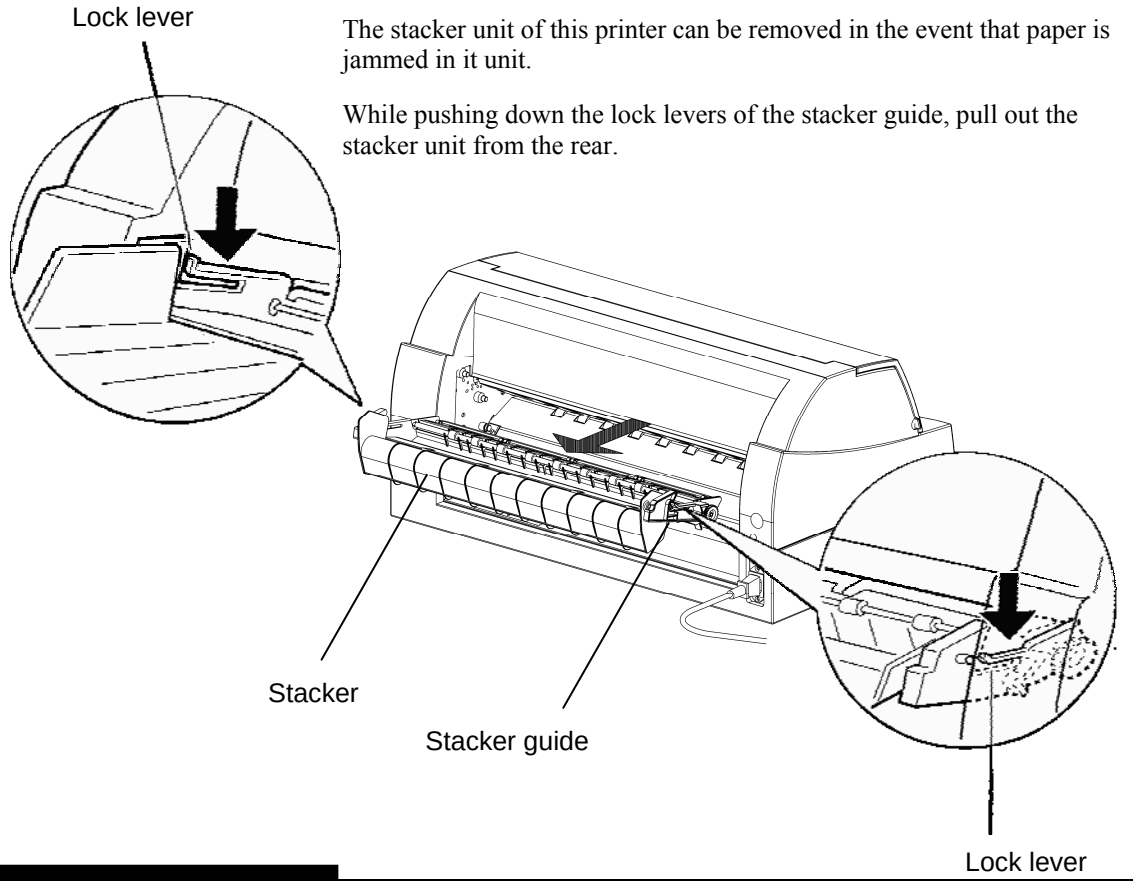
The control panel of this printer can be pulled down toward the front as necessary, such as when jammed paper must be removed.



Removing the stacker unit

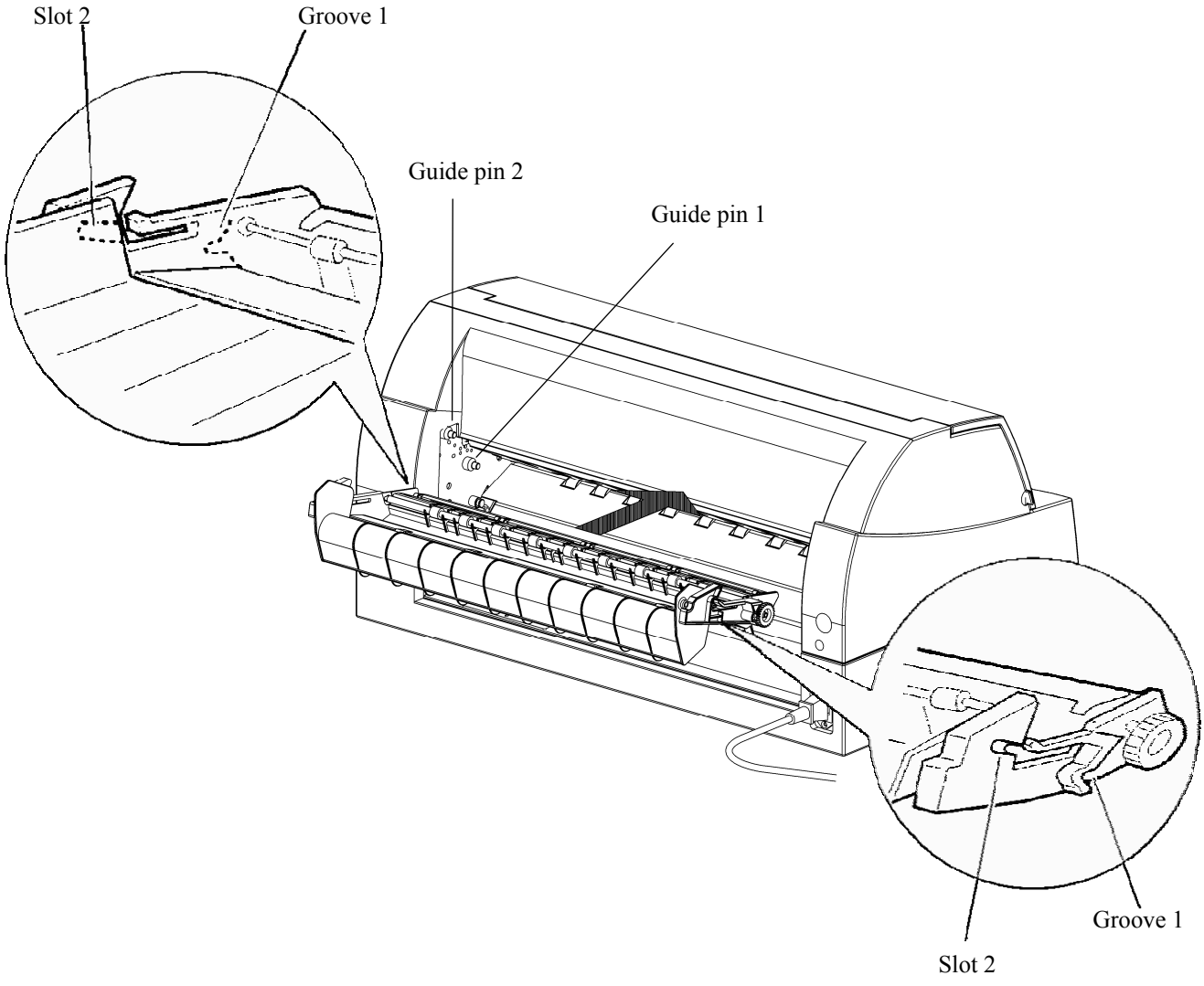
The stacker unit of this printer can be removed in the event that paper is jammed in it unit.

While pushing down the lock levers of the stacker guide, pull out the stacker unit from the rear.



Mounting the stacker unit

Position groove 1 over guide pin 1 on the right and left sides of the stacker unit. Then, push in the stacker unit until guide pin 2 is hooked onto slot 2.



7

TROUBLE-SHOOTING

Your printer is extremely reliable, but occasional problems may occur. You can solve many of these problems yourself, using this chapter.

If you encounter problems that you cannot resolve, contact your dealer for assistance.

This chapter is organized as follows:

- Solving problems
- Diagnostic functions
- Getting help

SOLVING PROBLEMS

The tables in this section describe common printer problems and their solutions. The following types of problems are considered:

- Print quality problems
- Paper handling problems
- Operating problems
- Printer failures

Print Quality Problems

Poor print quality or other printing problems are often caused by incorrect printer setup or incorrect software settings. A gradual decrease in print quality usually indicates a worn ribbon. Table 7.1 identifies common print quality problems and suggests solutions.

Table 7.1 Print Quality Problems and Solutions

Problem	Solution
Printing is too light or too dark.	Make sure that the ribbon cartridge is properly installed and that the ribbon feeds smoothly. Check ribbon wear. Replace the ribbon if necessary.
	Check the difference of thickness of medium. If auto adjustment function detects difference level of medium, it doesn't work properly. In this case you must adjust for paper thickness manually. See ADJUSTING PAPER THICKNESS in Chapter 3.
	If you adjust for paper thickness manually, tune-up as follows. **If printing is too light, decrease setting.** **If printing is dark, increase setting.** Note Printer accepts the value for paper thickness from Printer Driver or application program. In this case, check the setting of the Printer Driver or application program at your host computer. And then tune the value by way above.
Stains or smudges appear on the page.	Check ribbon wear. Replace the ribbon if necessary. Check whether the tip of the print head is dirty. Clean the head with a soft cloth if necessary.
The page is blank.	Make sure that the ribbon cartridge is properly installed.
Printing is erratic or the wrong characters are printed. One or more "?" characters are printed.	Make sure that the interface cable is securely connected to both the printer and computer. Make sure that the printer emulation selected in your software is the same as the emulation selected on the printer. See the section **Selecting an Emulation** in Chapter 2. If you are using an RS-232C serial interface, make sure that the serial settings required by your software or computer are the same as the settings on the printer. See the section **Hardware Items and Options** in Chapter 5.

Table 7.1 Print Quality Problems and Solutions (Cont.)

Problem	Solution
Characters are lost at the left or right end.	If lost area is about 10mm (3mm) from left and right edge of continuous forms(single sheet), Area-over detection control woks properly. In this case make sure that paper size, paper position, and left and right margins are properly set. See the section **Configuration Items and Options** in Chapter 5. Note Preprinted dark color area, shape of corner cut, paper skew may cause incorrect detection. Please don't use medium like this. If you must use medium like this absolutely, you can disable Area-over detection by using setup mode. But risk of print head broken is increase.
	Incorrect paper size selection of the Printer Driver causes right side area is lost (exactly Printer Driver divide the page by paper size setting and postpone divided right page). Please check the paper size setting.
Printing is vertically misaligned (jagged).	Use the printer's V-ALMNT function to check the vertical print alignment. If necessary, adjust the print alignment. See the section **Using the Diagnostic Functions** in Chapter 5.
	Smaller adjustment for paper thickness causes vertically misalignment too. Please refer to Printing is too light or too dark.
The top margin is wrong.	The top margin is the sum of the top-of-form setting, the software-specified top margin, and the printer's TOP-MRG setting. Proceed as follows: • Make sure that the top-of-form setting is correct. The factory default is 25.4 mm (1 inch). See the section **Changing Top-of Form** in Chapter 5. • Check the software-specified top margin. Refer to your software documentation. • Check the printer's TOP-MRG setting. See the section **MENU1 and MENU2 Items and Options** in Chapter 5.

Table 7.1 Print Quality Problems and Solutions (Cont.)

Problem	Solution
Lines are double spaced instead of single spaced.	Check the line spacing setting in your software. Change the CR-CODE setting in the printer setup mode to CR ONLY. See the section **MENU1 and MENU2 Items and Options** in Chapter 5.
The printer overprints on the same line.	Change the CR-CODE setting in the printer setup mode to CR & LF. See the section **MENU1 and MENU2 Items and Options** in Chapter 5.
The next print line starts where the previous line ended instead of at the left margin.	Change the LF-CODE setting in the printer setup mode to LF & CR. See the section **MENU1 and MENU2 Items and Options** in Chapter 5.
The top of form of continuous form displaces gradually.	Variation of the top of form is saturated in a few pages and displacement is about 1mm or less. In this case adjust value is prepared in setup mode. See ADJUST Items and Options and search <FCNTADJ> or <RCNTADJ>.
	Variation of the top of form isn't saturated. In this case setting of page length isn't correct. Make sure that page length setting equal actual page length exactly. In general page length of continuous form is multiple of 0.5inch. Anyway don't set page length of continuous forms using mm unit.

Paper Handling Problems

Table 7.2 describes common paper handling problems and suggests solutions. See Chapter 3 for detailed procedures on loading and using paper.

Table 7.2 Paper Handling Problems and Solutions

Problem	Solution
Paper cannot be loaded or fed.	Make sure that the paper path indicator (FRONT TRACTOR, REAR TRACTOR, CUT SHEET) lights correctly. Press the PAPER PATH button to select the paper path. Make sure that the paper covers the paper-out sensor, i.e., the left paper edge is within 52 mm for single sheets or 41 mm for continuous forms from the left edge of the platen. (This problem cannot occur if you use the forms tractor unit or insert a single sheet with its left edge in contact with the left paper guide.) Make sure that the tractor unit is correctly installed and that the tractor shaft gear engages the platen shaft gear. If you are using a cut sheet feeder, make sure that the bin lever is set to the "CLOSED" position. (The bin lever is on the left side of the feeder.) If you are using a cut sheet feeder, make sure that the feeder is firmly mounted on the printer and the cable is correctly connected.
Paper manually loaded is ejected without printing	If you are using the paper skew detection (option), adjust the paper guide on the paper table for the print start position and correctly slide the sheet along the guide.

Table 7.2 Paper Handling Problems and Solutions (Cont.)

Problem	Solution
Paper jams while loading.	Turn off the printer and remove the jammed paper. Remove any obstructions from the paper path. If you are using a cut sheet feeder, make sure that the bin lever is set to the "CLOSED" position. (The bin lever is on the left side of the feeder.) Make sure that the paper is not folded, creased, or torn. Reload the paper. Make sure that the paper table is in normal mode. Set the paper table to normal mode.
Paper jams while printing.	Turn off the printer and remove the jammed paper. Remove any obstructions from the paper path. For continuous forms, make sure that the incoming and outgoing paper stacks are correctly placed. Paper should feed straight. Make sure that the paper table is in normal mode. Set the paper table to normal mode. If you are using a cut sheet feeder, make sure that the bin lever is set to the "CLOSED" position. (The bin lever is on the left side of the feeder.) Reload the paper.
Paper slips off the forms tractors or the perforated holes of the paper tear during printing.	Make sure that the forms tractors are positioned correctly for the width of your paper and that the perforated holes of the paper fit directly over the tractor sprockets.

Operating Problems

Table 7.3 identifies common operating problems and suggests solutions. If you cannot resolve a problem, contact your dealer.

Table 7.3 Operating Problems and Solutions

Problem	Solution
The power does not turn on.	Make sure that the "I" on the printer power switch is depressed. Make sure that the power cord is securely connected to both the printer and the outlet. Make sure that the power outlet is functional. Turn the power off. Wait 100 seconds and then turn the printer on again. If the printer still has no power, contact your dealer.
The printer is on but it will not print.	Make sure that the printer is online. Make sure that the interface cable is securely connected to both the printer and the computer. If the red PAPER OUT indicator is lit, load paper. Run the printer self-test (see Chapter 5). If the self-test executes normally, the problem is caused by the interface, the computer, incorrect printer settings, or incorrect software settings. Make sure that the printer emulation selected in your software is the same as the emulation selected on the printer. See the section **Selecting an Emulation** in Chapter 2. Make sure that the front cover is completely closed. If you are using an RS-232C serial interface, make sure that the serial settings required by your software or computer are the same as the settings on the printer. See the section **Hardware Items and Options** in Chapter 5.
The cut sheet feeder does not operate.	Make sure that the cut sheet feeder is firmly mounted on the printer. Make sure that the cable is correctly connected.
The FRONT DIR indicator blinks.	Remove the printed sheet of paper from the paper table.

Printer Failures

A user cannot generally resolve a problem involving defective printer hardware. On detecting a fatal error, the printer will:

- Stop printing
- Beep four times
- Turn the ONLINE indicator off

The control panel displays alarms. The meanings of alarms can be checked in the following table.

Alarm display function(LED)

This printer has a function for distinguishing between alarms by using the blinking of individual lamps on the control panel.

From the combination of blinking lamps in an alarm state, the meaning of the alarm can be determined as shown in the following table.

Lamp / Alarm name	PAPER OUT	REMOVE PAPER	FRONT DIR	QUIET	AUTO GAP	HI IMPACT	TRACTOR F	TRACTOR R	CUT SHEET	MENU1	MENU2	ONLINE	Condition of occurrence
LES alarm	◎	◎					◎						LES could not be detected during the space initial operation.
Space problem alarm	◎	◎						◎					The shield board could not be detected normally by the LRES sensor.
Fan alarm	◎	◎							◎				The cooling fan could not rotate.
Fire check alarm SP motor	◎	◎								◎			Abnormally high current of motor driver was detected.
Fire check alarm Ribbon motor	◎	◎									◎		Abnormally high current of motor driver was detected.
HCPP (cut sheet or continuous forms paper switching) alarm	◎		◎					◎					Switching between cut sheet paper and continuous forms paper was not possible.
Fire check alarm LF motor	◎		◎						◎				Abnormally high current of motor driver was detected.
Fire check alarm CSF motor	◎		◎							◎			Abnormally high current of motor driver was detected.
Overload alarm	◎			◎			◎						An overload occurred during printing, and second pass printing was performed. However, the power source voltage was not restored.
Low voltage alarm	◎			◎				◎					The power source voltage dropped below the specified level when no printing was in progress.
Fire check alarm Print Head	◎			◎					◎				Abnormally high current or long driving of print head driver was detected.
Over voltage alarm	◎			◎						◎			Over voltage of power source was detected.
APTC gap alarm	◎				◎		◎						During the APTC operation, paper was detected immediately after the start of approach motion, or no paper was detected.
APTC hop position sensor alarm	◎				◎			◎					During the APTC operation, no reference position was detected.
ROM/RAM alarm	◎					◎	◎						A sum-check error or read/write error occurred, or no CG-ROM is mounted.
Sector protect alarm	◎					◎		◎					A sector protect check of flash ROM was performed, but no sector protect information was found.

◎: Blinking

Blank: Off

Alarm display function(LCD)

This printer has a function for distinguishing between alarms by using the blinking of message lamp and LCD on the control panel.

Alarm name	Message Lamp	LCD	Condition of occurrence
LES alarm	◎	FATAL! LES ALARM	LES could not be detected during the space initial operation.
Space problem alarm	◎	FATAL! SPACE ALARM	The shield board could not be detected normally by the LRES sensor.
Fan alarm	◎	FATAL! FAN ALARM	The cooling fan could not rotate.
Fire check alarm SP motor	◎	FATAL! SPM ALARM	Abnormally high current of motor driver was detected.
Fire check alarm Ribbon motor	◎	FATAL! RBFM ALARM	Abnormally high current of motor driver was detected.
HCPP (cut sheet or continuous forms paper switching) alarm	◎	FATAL! HCPP ALARM	Switching between cut sheet paper and continuous forms paper was not possible.
Fire check alarm LF motor	◎	FATAL! LFM ALARM	Abnormally high current of motor driver was detected.
Fire check alarm CSF motor	◎	FATAL! CSFM ALARM	Abnormally high current of motor driver was detected.
Overload alarm	◎	FATAL! OVERLOAD ALARM	An overload occurred during printing, and tripartite printing was performed. However, the power source voltage was not restored.
Low voltage alarm	◎	FATAL! LOW VOLT ALARM	The power source voltage dropped below the specified level when no printing was in progress.
Fire check alarm	◎	FATAL! HEAD ALARM	Abnormally high current or long driving of print head driver was detected.
High voltage alarm	◎	FATAL! HIGH VOLT ALARM	Over voltage of power source was detected.
APTC gap alarm	◎	FATAL! APTC GAP ALARM	During the APTC operation, paper was detected immediately after the start of approach motion, or no paper was detected.
APTC home position sensor alarm	◎	FATAL! APTC HPS ALARM	During the APTC operation, no reference position was detected.
ROM/RAM alarm	◎	FATAL! ROM/RAM ALARM	A sum-check error or read/write error occurred, or no CG-ROM is mounted.
Sector protect alarm	◎	FATAL! F-ROM ALARM	A sector protect check of flash ROM was performed, but no sector protect information was found.

◎: Blinking

Blank: Off

Responses to alarm occurrences

Your first response to each alarm should be as described in the following table.

Problem	Solution
LES alarm	Remove any paper dust, which may cause problems in carriage operation.
Space problem alarm	Same solution same as above should be done. Check adjustment for paper thickness. Smaller setting causes spacing problem.
Fan alarm	Remove any dust of ventilation near the Fan motor.
APTC gap alarm	Check the paper thickness (0.04 to 0.65 mm). Check whether the paper has different thicknesses or whether the paper has filing holes.

For problems other than the above, request your printer dealer to make repairs.

Especially Fire Check is happen, please refrain using printer.

DIAGNOSTIC FUNCTIONS

The printer diagnostic functions are SELF-TST, HEX-DUMP, and V-ALMNT.

- SELF-TST tells you whether the printer hardware is functioning correctly. If the printer hardware is functional, any problems you are having are probably caused by incorrect printer settings, incorrect software settings, the interface, or the computer.
- HEX-DUMP allows you to determine whether the computer is sending the correct commands to the printer, and whether the printer is executing the commands correctly. This function is useful to programmers or others who understand how to interpret hex dumps.
- V-ALMNT allows you to check and, if necessary, correct the printer's vertical print alignment.

For details on using these functions, all of which are available in the printer setup mode, see the section **Using the Diagnostic Functions** in Chapter 5.

GETTING HELP

If you are not able to correct a problem using this chapter, contact your dealer for assistance. Be prepared to provide the following information:

- Your printer model number, serial number, and date of manufacture. Look for this information on the rating label at the back of the printer.
- Description of the problem

- Type of interface you are using
- Names of your software packages
- List of the printer default settings. To print the default settings, see the section **Printing a List of Selected Options** in Chapter 5.

8

INSTALLING OPTIONS

The installaion of options allows you to expand the capabilities of your printer. Options available for the printer include:

- LAN card
- Cut sheet feeder
- Tractor unit
- Large stacker
- Large Paper Table

The LAN card is a user installable option, but can be installed only on a printer model with the parallel and USB interfaces. For information on the installation procedure, refer to the manual that comes with the LAN card.

Options can be purchased from your dealer. Order numbers for options are given in Appendix A.

INSTALLING THE CUT SHEET FEEDER

This chapter describes what to do after installing cut sheet feeder.

A cut sheet feeder (SF940) allows you to automatically feed single sheets. It can be mounted on the front or the rear of the printer.

When attaching the cut sheet feeder to the front of the printer, removing the tractor and replacing soundproof cover with large or small paper table are necessary.

For both front and rear, the cut sheet feeder can handle a max. of 5-ply multipart media.

When installing the front and rear cut sheet feeders, the printer assigns the first bin to the front feeder. You can change the assignment using set up mode.

⚠ WARNING	
Electric shock	**Before mounting or removing the cut sheet feeder, turn off the power switches of the personal computer and the printer and remove the power plug from the outlet. Otherwise, you may receive electric shock.**

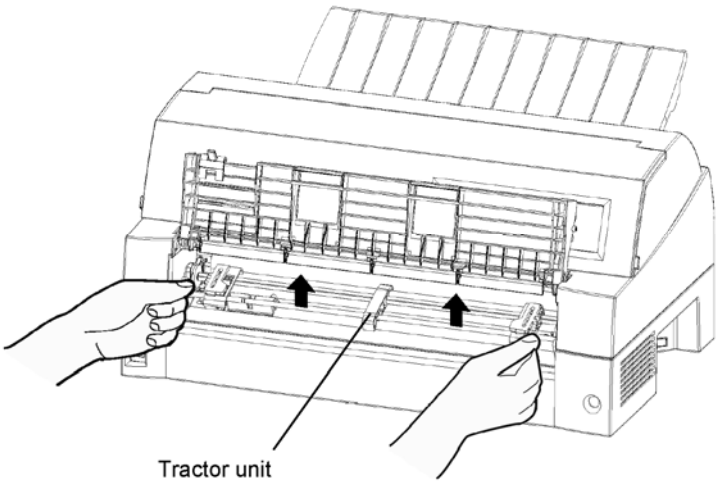
Installing on the front side of the printer

1. **Turn off the printer power.**

   Confirm that the printer power is turned to the ○ side.

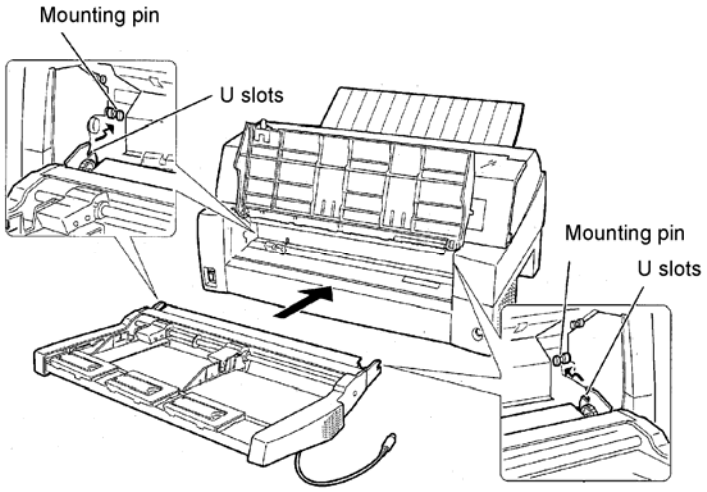
2. **Removing the tractor unit**

   Raise the paper table and remove the tractor unit. (For details on mounting and removing the tractor unit, see "Selecting the Tractor Unit Position" on page 2-10.)

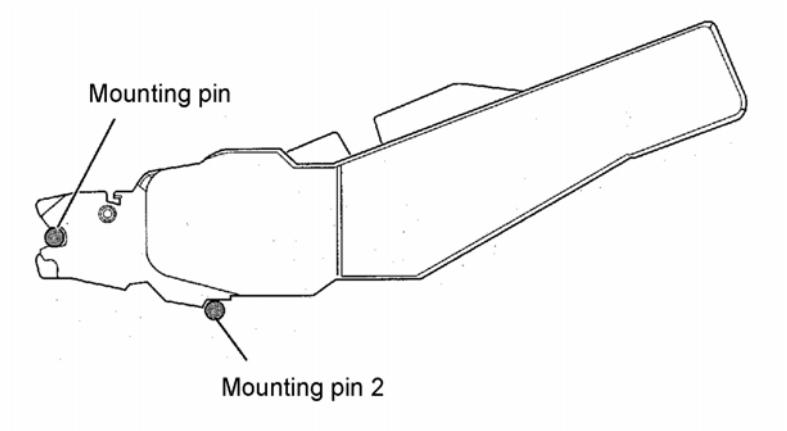


3. **Installing the cut sheet feeder**

   Adjust the U slots made on both sides of the cut sheet feeder to the mounting pins inside the printer and lower the cut sheet feeder slowly.



   Check that the cut sheet feeder frame is correctly mounted on mounting pin 2.



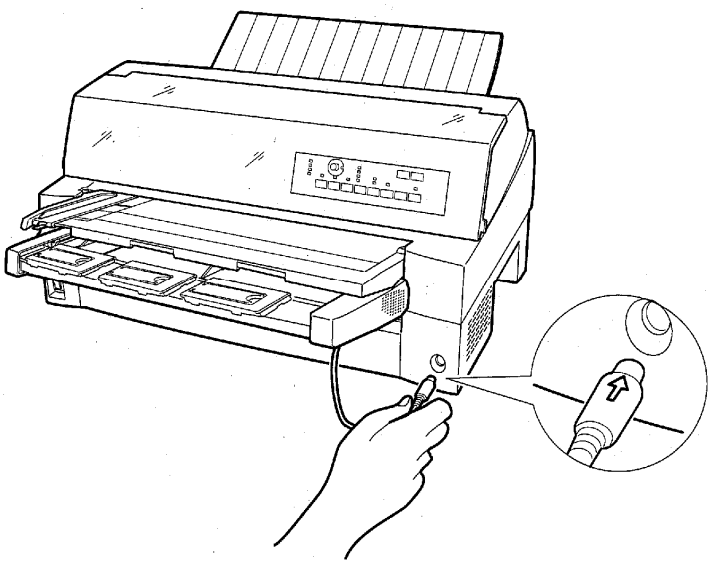
4. Replacing the paper table

Be sure to replace the paper table. (See "Setting the paper table" on page 2-5.)

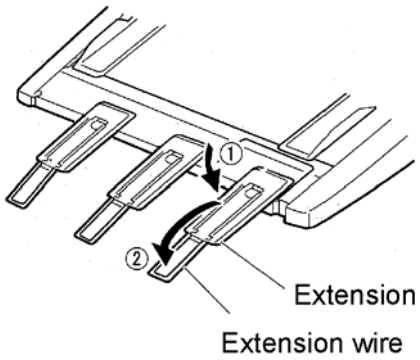
If the paper table is incorrectly set, a paper jam may occur.

5. Connecting the cable

Connect the cut sheet feeder cable to the connector on the front right of the printer. Insert the cable with the connector arrow mark up.



6. **Extend the extension and extension wire in the order from (1) to (2) according to the size of the paper to be used.**



Installing on the rear side of the printer

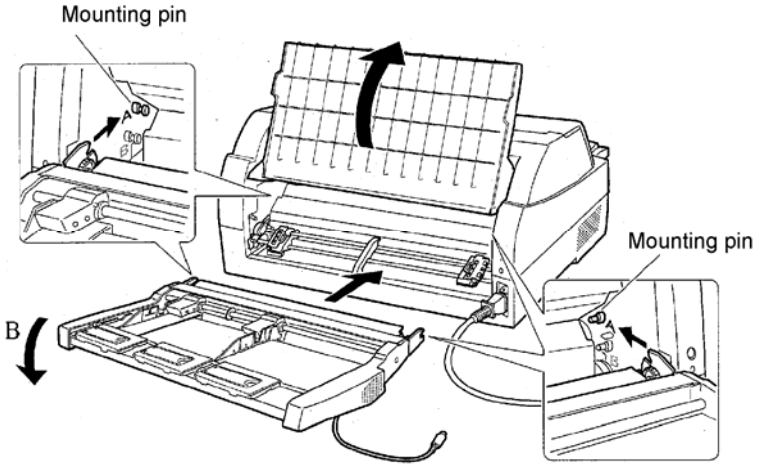
Before mounting the cut sheet feeder, turn off the printer power.

1. **Turn off the printer power.**

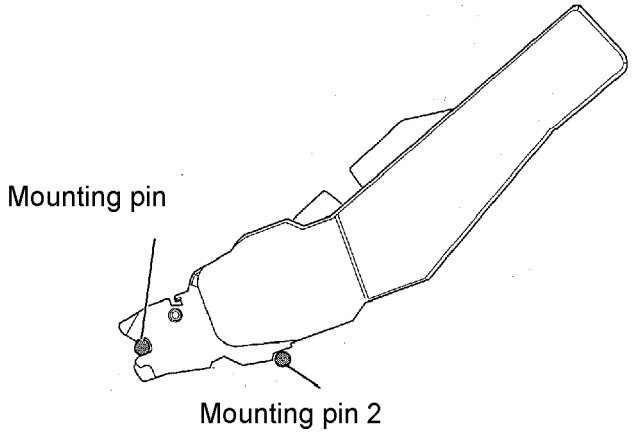
   Confirm that the printer power is turned to the O side.

2. **Installing the cut sheet feeder**

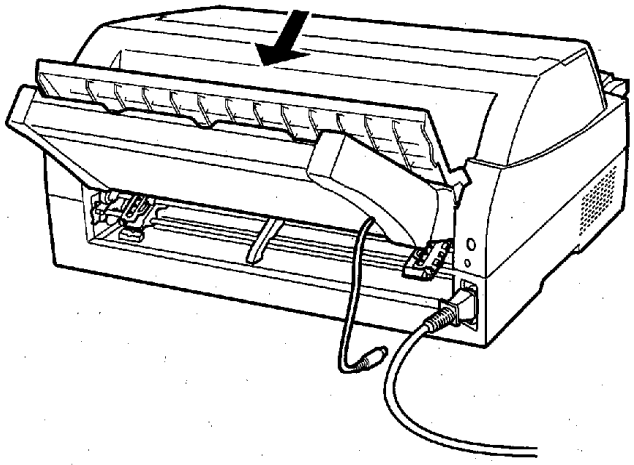
   Open the rear stacker. Hold both sides of the cut sheet feeder and adjust the U slots made on both side of the cut sheet feeder to the mounting pins inside the printer. (Attach the slots with the letter A of the cut sheet feeder adjusted to that on the printer side.) Then, lower the cut sheet feeder like it turns in the direction of arrow B, using the mounting pins as supporting points.



Check that the cut sheet feeder frame is correctly mounted on mounting pin 2.

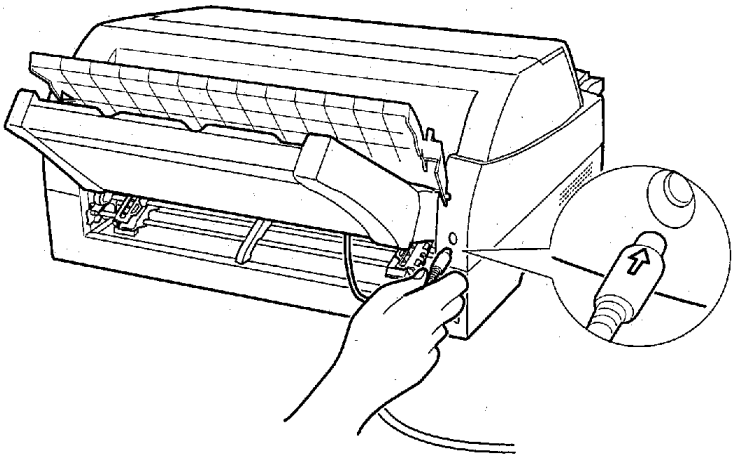


3. Close the rear stacker.

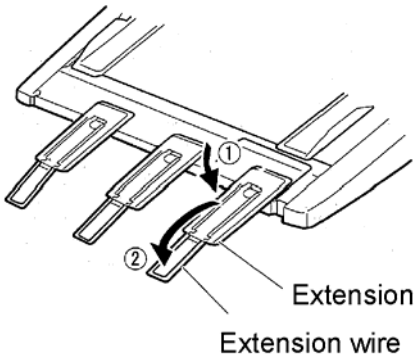


4. Connecting the cable

Connect the cut sheet feeder cable to the connector on the rear right of the printer. Insert the cable with the connector arrow mark up.



5. Extend the extension and extension wire in the order from (1) to (2) according to the size of the paper to be used

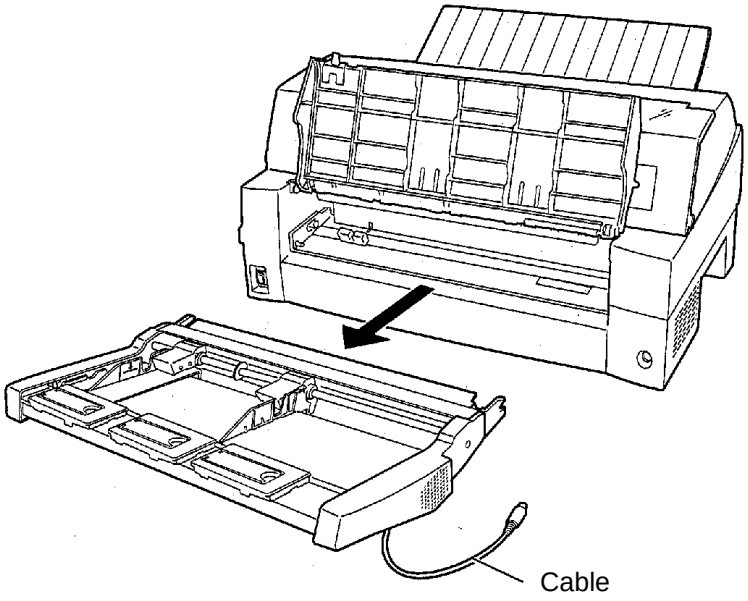


Removing the Cut Sheet Feeder

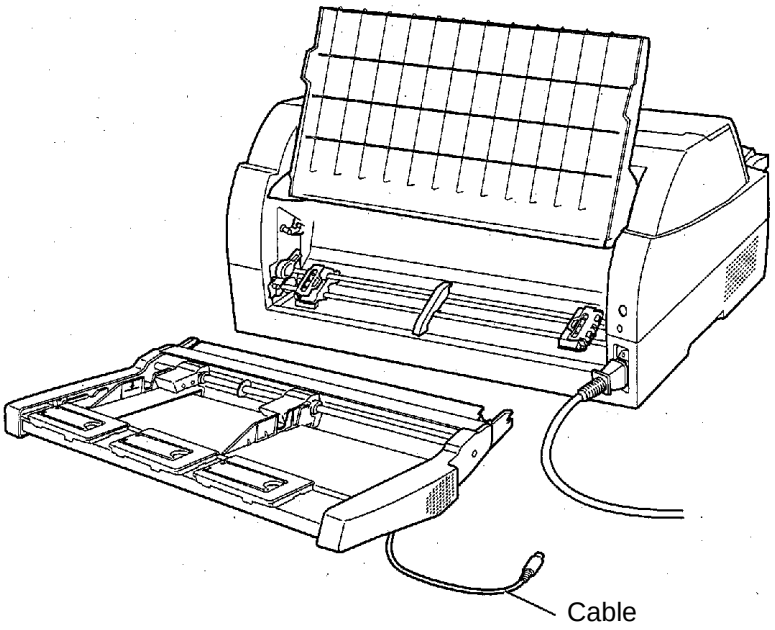
Before removing the cut sheet feeder, disconnect the cable.

⚠ WARNING		
	Electric shock	**Before mounting or removing the cut sheet feeder, turn off the power switches of the personal computer and the printer and remove the power plug from the outlet. Otherwise, you may receive electric shock.**

When mounted on the front side of the printer



When mounted on the rear side of the printer



INSTALLING THE TRACTOR UNIT

A tractor unit is supplied as standard equipment attached to the front of the printer.

This unit may also be attached to the rear of the printer for rear feeding of continuous forms.

For details on removing and mounting the tractor unit, see “Selecting the Tractor Unit Position” on page 2-10.

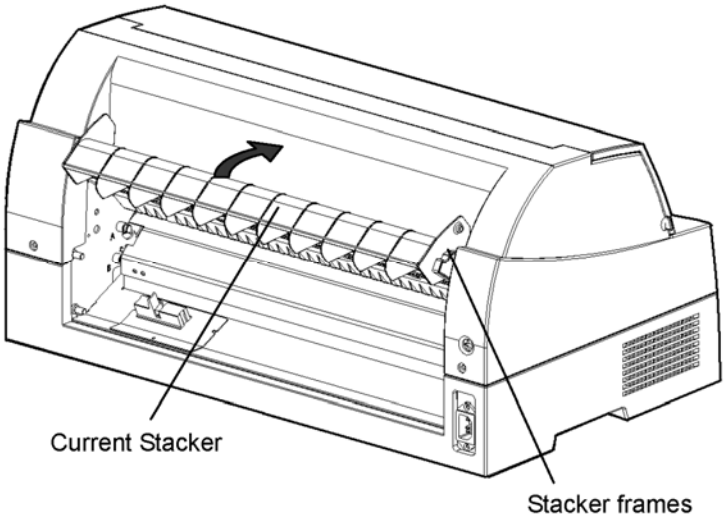
INSTALLING THE LARGE STACKER

To continuously stack cut sheets or eject long cut sheets to the rear, mount the large stacker.

Also, if a cut sheet feeder is mounted at the rear, the stacker must be replaced with the large stacker even if cut sheets need not be continuously stacked.

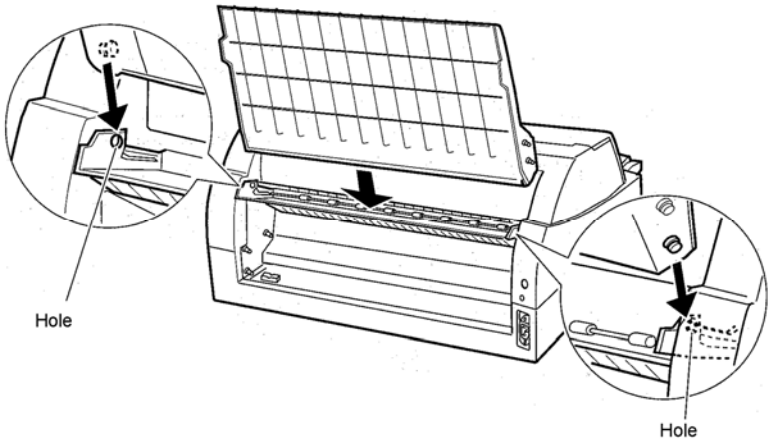
1 Removing the current stacker

1. Lift up the current stacker in the direction indicated by the arrow.
2. With the stacker in the condition described in step 1, push out the right and left stacker frames to separate them from the protrusions on the stacker plate.



2 Mounting the rear stacker

At the rear of the printer, push the protrusions on both sides of the rear stacker into the holes inside the rear stacker guide as shown in the following figure.

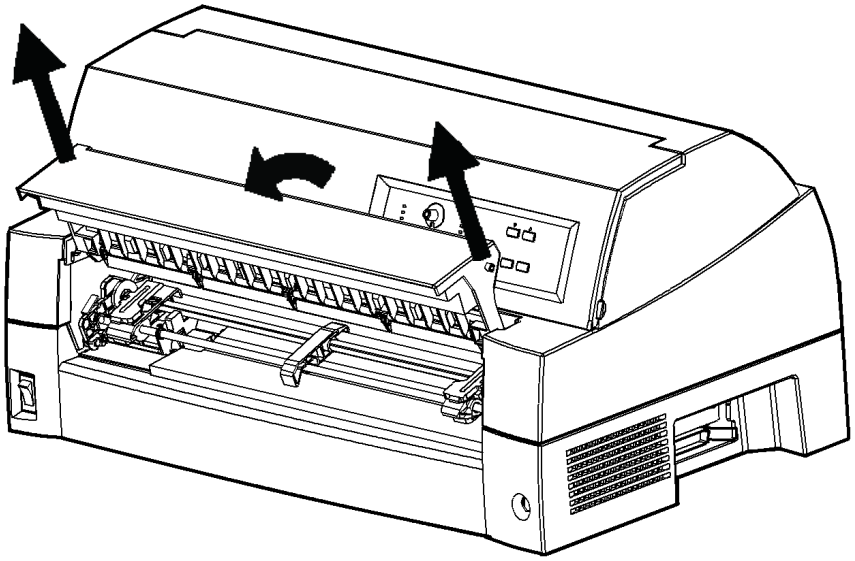


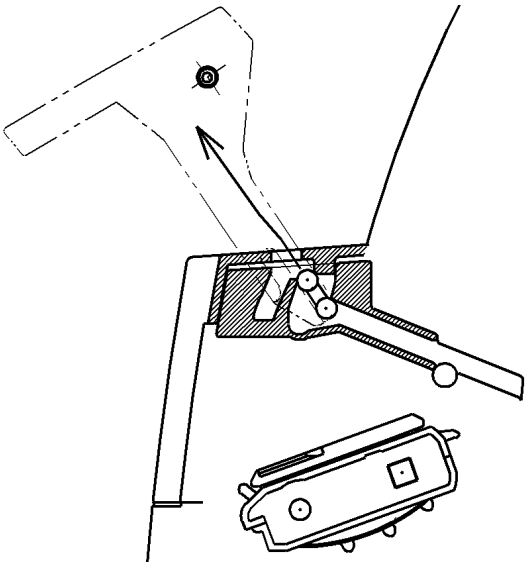
INSTALLING THE LARGE PAPER TABLE

To use long cut sheets, mount the large cut sheet table.

1 Removing the soundproof cover

After opening the soundproof cover and adjusting it to a tilted position, remove the paper table by pulling it to separate the left and right protrusions on the soundproof cover ends from the grooves on the cover.

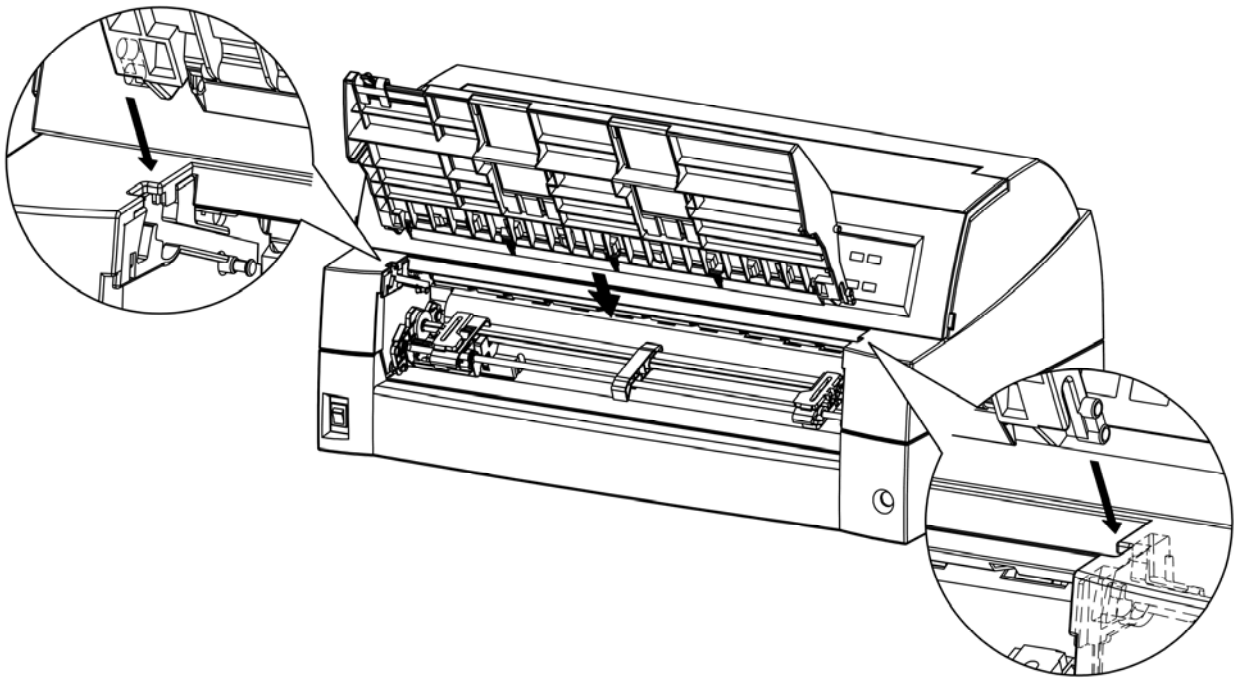


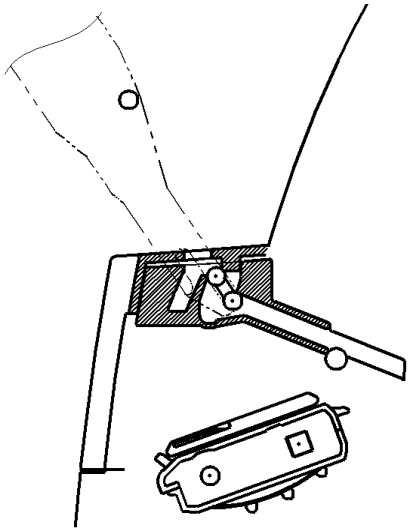


2. Installing the Large Paper Table

Insert and push the left and right protrusions on the paper table ends into the grooves on the cover as shown in the following figure. Set the paper table in the normal position. (See "Setting the paper table" in Chapter 2.)

The new large paper table can be opened or closed in the same way as the removed paper table.





Make sure the protrusions are inserted completely as right figure.

A

SUPPLIES AND OPTIONS

This appendix lists the supplies and options available for the printer.

Contact your dealer for information on ordering any of these items.

SUPPLIES

Supplies	Order Number
Ribbon cassette	
Black ribbon	CA05463-D807
Ribbon sub cassette	
Black ribbon	CA05463-D877
Print head	KA02033-E223

OPTIONS

Options	Order Number	Description
LAN card	KA02012-C103	Installable only on a printer model with the parallel and USB interfaces.
Cut sheet feeder (SF940)	KA02027-D750	
Tractor Unit	KA02038-E650	
Large Stacker	KA02038-D160	
Large paper table	KA02038-D150	
Small paper table	KA02039-D150	

B

PRINTER AND PAPER SPECIFICATIONS

This appendix gives the physical, functional, and performance specifications for the printer.

It also gives detailed paper specifications.

PHYSICAL SPECIFICATIONS

Dimensions

Height: 290 mm (11.4 in)

Width: 600 mm (23.6 in)

Depth: 350 mm (13.8 in)

Weight: 22.5 kg (50 lb)

AC power requirements

M33325A: 100 to 120 VAC ±10%; 50/60 Hz
M33325B: 220 to 240 VAC ±10%; 50/60 Hz

Power consumption

Model:M33325A
Average 485 VA
Maximum 820 VA
Model:M33325B
Average 360 VA
Maximum 810 VA

Heat generation Average 980 kJ/h

Interface Centronics parallel and RS-232C serial
Centronics parallel and USB and LAN (option).

Data buffer size 0, 256, 2K, 8K, 24K, 32K, 96K, or 128K bytes

Download buffer Maximum 128K bytes
(128K minus data buffer size)

Operating environment 5 to 38°C (41 to 100°F)
30% to 80% RH (no condensation)
Wetbulb temperature, less than 29°C (84°F)

Storage environment -15 to 60°C (-4 to 140°F)
10% to 95% RH (no condensation)

Acoustic noise Average _ _ dB (A)
ISO 7779 (Bystander Position-Front)

FUNCTIONAL SPECIFICATIONS

Print method	Impact dot matrix with a 0.2 mm, 24-wire head	
Print direction	Bidirectional logic-seeking or unidirectional seeking	
Character cell	Horizontal × vertical	
Letter (10 cpi):	36 × 24 dots	
Letter (12 cpi):	30 × 24 dots	
Report:	18 × 24 dots	
Draft:	9 × 24 dots	(MODE 1)
	12 × 24 dots	(MODE 2)
High-speed draft:	9 × 24 dots	
Paper handling		
Standard:	Common push tractor on front.	
	(Moving tractor unit to rear is possible)	
	Paper loading by LOAD button Advancing perforations to tear-off edge by TEAR OFF button	
	Parking continuous forms is available.	
Optional:	Paper Table for friction-feed (cut sheets).	
	Cut sheet feeder(for front or rear)	
	Tractor unit (for 2nd tractor)	
Paper type	1 to 5-copies for cut sheet feeder	
	1 to 9-copies for tractor and paper table	
Paper size		
Continuous Width:	102-420 mm (4-16.5 in)	
Length:	102 mm (4 in) or greater	
Cut sheets (Paper table) Width:	55-420 mm (2.16-16.5 in)	
Length:	70-420 mm (2.76-16.5 in)	
(Cut sheet feeder)		
Width:	100-420 mm (4-16.5 in)	
Length:	70-420 mm for front cut sheet feeder (2.76-16.5 in)	
	100-420 mm for front cut sheet feeder (4-16.5 in)	

Note:

To use cut sheets, the optional paper table is required. More over, to use cut sheets exceeding 297 mm in length, the optional large paper table and large stacker are required. For detail see Chapter 3.

Paper thickness	Up to 0.65 mm (0.026 inch)
Page length	
By software	Programmable in one line or inch increments in all emulations
By control panel	Depends upon emulations. Default is 11 inches for all emulations.
DPL24C+/XL24E:	3, 3.5, 4, 5, 5.5, 6, 7, 8, 8.5, 11, 11.6, 12, 14, or 18 inches
ESC/P2:	4, 4.5, 5, 5.5, ..., 11, 11.5, ..., 22 inches
Number of copies	Up to 8, including the original Up to 9, including the original (At HI IMPACT mode)
Paper stack	
Cut sheet	100 sheets (A4 size, 1p, 55 kg/m^2) (The stack of cut sheets may decrease, depending upon the various paper conditions such as quality, the extent of curl, and storage environment.)
Command sets (emulations)	
Resident	Fujitsu DPL24C PLUS IBM Proprinter XL24E Epson ESC/P2
Character sets	
DPL24C+/XL24E:	• IBM PC character sets 1 and 2 (code pages 437) • IBM PS/2 character sets (code pages and other national character sets (57 + 2 languages in total) • Fujitsu character sets (691 characters)
ESC/P2:	• Italic character set Graphics character sets 1 and 2 • IBM PS/2 character sets (code pages) and other national character sets (61 + 2 languages in total)

Fonts

Resident	Nineteen fonts available
Bit map:	Courier 10, Pica 10, OCR-B 10, OCR-A 10 , Prestige Elite 12, Boldface PS, Correspondence, Compressed, Draft, and High-speed Draft.
Scalable:	Courier, Timeless, and Nimbus Sans ®; each in normal, bold, and italic styles
Downloaded	Available from independent vendors

Line spacing	1, 2, 3, 4, 5, 6, 7, or 8 lines per inch. Programmable in 1/360 inch or various increments for image graphics.
Character pitch	2.5, 3, 5, 6, 10, 12, 15, 17.1, 18, or 20 cpi, or proportional spacing. Programmable in 1/360 inch or various increments for image graphics.

Characters per line

10 cpi:	136 cpl
12 cpi:	163 cpl
15 cpi:	204 cpl
17.1 cpi:	232 cpl
18 cpi:	244 cpl
20 cpi:	272 cpl
	cpi: characters per inch
	cpl: characters per line

Note

Draft has 2 modes as follows. (Default setting is mode2)
To select these mode see chapter 5 and search <DQ-MODE>
MODE1: Draft is replaced with hi-speed Draft for high speed printing.
MODE2: Draft is printing as Draft.

PERFORMANCE SPECIFICATIONS

Print speed

	10 cpi 12 cpi	
Letter:	180 cps 216 cps	
Report:	360 cps 432 cps	
Correspondence:	360 cps 432 cps	
Draft:	720 cps 864 cps	(MODE 1)
	540 cps 648 cps	(MODE 2)
Hi-speed draft:	720 cps 864 cps	

cpi: characters per inch
cps: characters per second

Line feed speed 50 ms per line at 6 lines per inch

Form feed speed 9 inches per second

Ribbon life Up to 15 million characters

Certification

Safety:

Model	Regulation	Country
M33325A	UL60950-1 United States (for 100 to 120 VAC)	United States
	CSA C22.2 No. 60950-1 (for 100 to 120 VAC)	Canada
M33325B	EN 60950-1 (for 220 to 240 VAC)	Germany

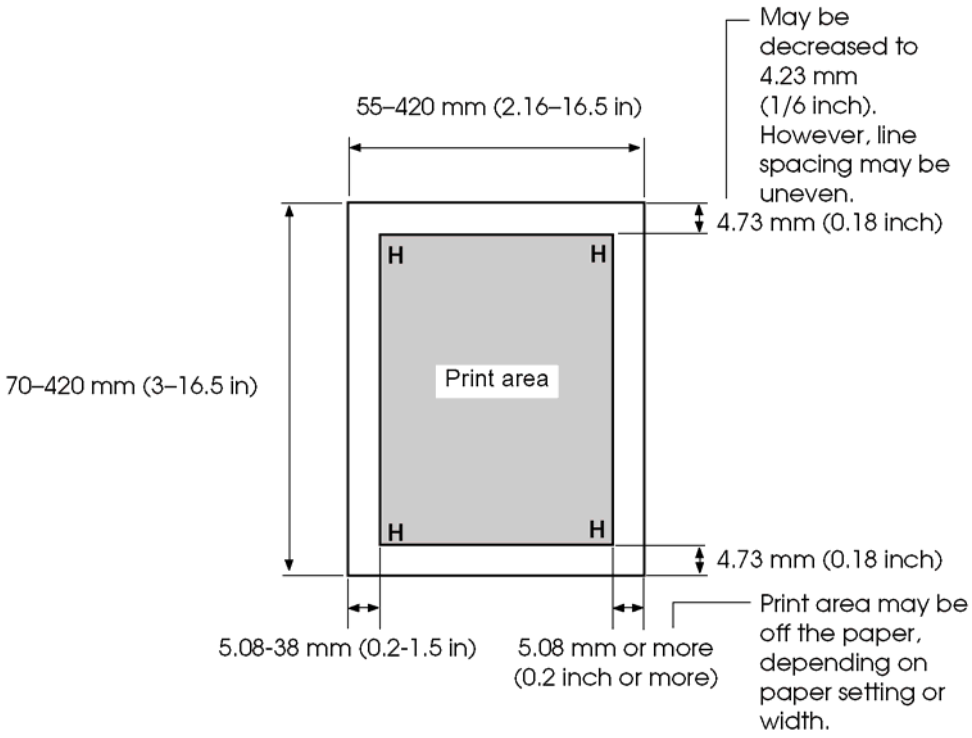
RFI regulation:

Model	Regulation	Country
M33325A	Class B of FCC Part 15B (for 100 to 120 VAC)	United States

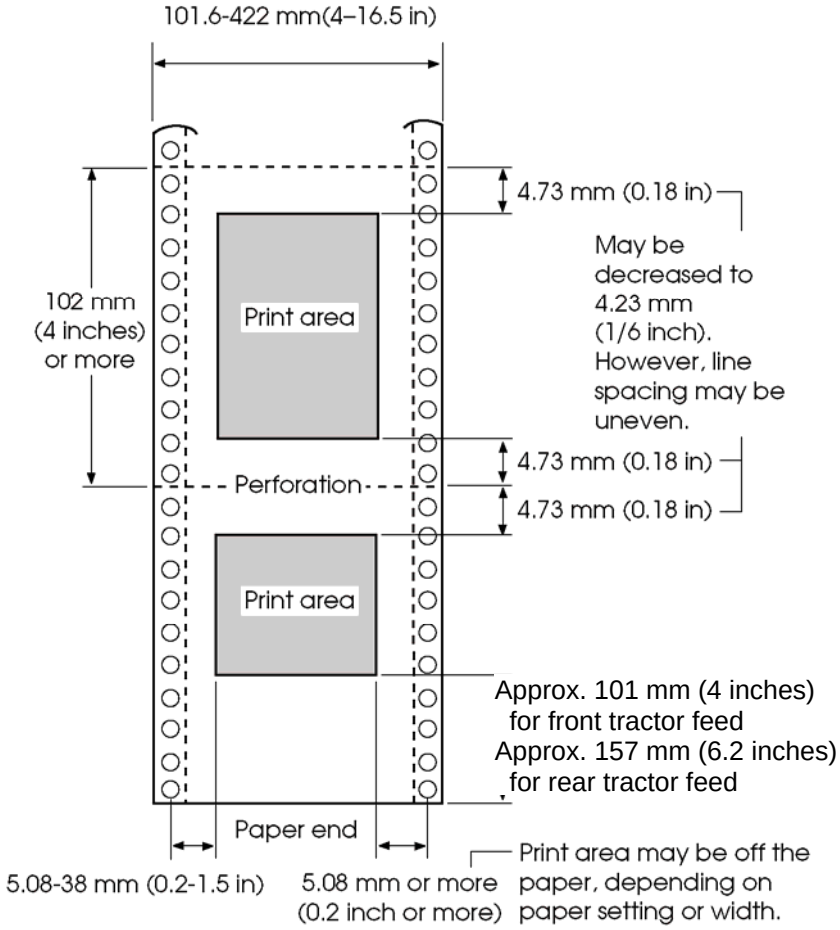
PAPER SPECIFICATIONS

Print Area

This section illustrates the recommended print area for single sheets and continuous forms.



Print area for single sheets

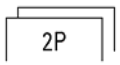
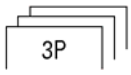
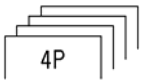
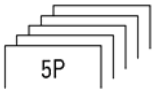
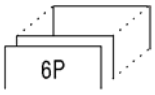


Print area for continuous forms

Paper Thickness

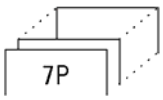
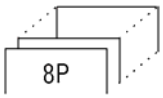
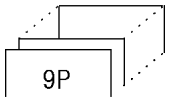
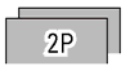
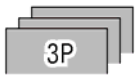
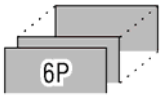
Paper thickness is given by the weight of the paper in either grams per square meter (g/m^2) or in pounds per bond (lbs/bond). The following table shows the allowable paper thickness for one-part paper or for each sheet of multipart paper. The total thickness must not exceed 0.65 mm (0.026 inch).

The weight of carbonless or carbon-backed paper may vary, depending upon the paper manufacturer. When using paper of borderline thickness, test the paper before running a job.

Type of Paper	Number of Parts	Thickness
One-part	Single	47-81 g/m^2 (40-70 kg or 12-22 lb)
Carbonless		
	Top	40-64 g/m^2 (34-55 kg or 11-17 lb)
	Bottom	40-81 g/m^2 (34-70 kg or 11-22 lb)
	Top	40-50 g/m^2 (34-43 kg or 11-13 lb)
	Middle	40-50 g/m^2 (34-43 kg or 11-13 lb)
	Bottom	40-81 g/m^2 (34-70 kg or 11-22 lb)
	Top	40 g/m^2 (34 kg or 11 lb)
	Middle (2-3p)	40 g/m^2 (34 kg or 11 lb)
	Bottom	40-81 g/m^2 (34-70 kg or 11-22 lb)
	Top	40 g/m^2 (34 kg or 11 lb)
	Middle (2-4p)	40 g/m^2 (34 kg or 11 lb)
	Bottom	40-64 g/m^2 (34-55 kg or 11-17 lb)
	Top	40 g/m^2 (34 kg or 11 lb)
	Middle (2-5p)	40 g/m^2 (34 kg or 11 lb)
	Bottom	40-64 g/m^2 (34-55 kg or 11-17 lb)

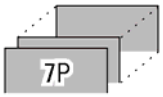
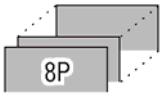
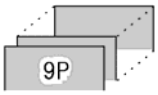
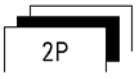
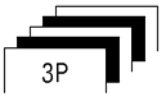
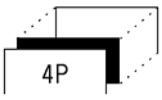
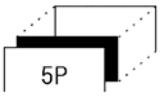
kg: Weight in kilograms of 1000 sheets of 788 × 1091 mm paper (1.16 g/m^2)

lb: Weight in pounds of 500 sheets of 17 × 22 inch paper (3.76 g/m^2)

Type of Paper	Number of Parts	Thickness
Carbonless		
	Top Middle (2-6p) Bottom	40 g/m^2 (34 kg or 11 lb) 40 g/m^2 (34 kg or 11 lb) 40-64 g/m^2 (34-55 kg or 11-17 lb)
	Top Middle (2-7p) Bottom	40 g/m^2 (34 kg or 11 lb) 40 g/m^2 (34 kg or 11 lb) 40-64 g/m^2 (34-55 kg or 11-17 lb)
	Top Middle (2-8p) Bottom	40 g/m^2 (34 kg or 11 lb) 40 g/m^2 (34 kg or 11 lb) 40-64 g/m^2 (34-55 kg or 11-17 lb)
Carbon-backed	*Do not use in high humidity environments.*	
	Top Bottom	40-64 g/m^2 (34-55 kg or 11-17 lb) 40-81 g/m^2 (34-70 kg or 11-22 lb)
	Top Middle Bottom	40-52 g/m^2 (34-45 kg or 11-14 lb) 40-52 g/m^2 (34-45 kg or 11-14 lb) 40-81 g/m^2 (34-70 kg or 11-22 lb)
	Top Middle (2-3p) Bottom	40 g/m^2 (34 kg or 11 lb) 40 g/m^2 (34 kg or 11 lb) 40-81 g/m^2 (34-70 kg or 11-22 lb)
	Top Middle (2-4p) Bottom	40 g/m^2 (34 kg or 11 lb) 40 g/m^2 (34 kg or 11 lb) 40-64 g/m^2 (34-55 kg or 11-17 lb)
	Top Middle (2-5p) Bottom	40 g/m^2 (34 kg or 11 lb) 40 g/m^2 (34 kg or 11 lb) 40-64 g/m^2 (34-55 kg or 11-17 lb)

kg: Weight in kilograms of 1000 sheets of 788 × 1091 mm paper (1.16 g/m^2)

lb: Weight in pounds of 500 sheets of 17 × 22 inch paper (3.76 g/m^2)

Type of Paper	Number of Parts	Thickness
Carbon-backed	*Do not use in high humidity environments.*	
	Top Middle (2-6p) Bottom	40 g/m^2 (34 kg or 11 lb) 40 g/m^2 (34 kg or 11 lb) 40-64 g/m^2 (34-55 kg or 11-17 lb)
	Top Middle (2-7p) Bottom	40 g/m^2 (34 kg or 11 lb) 40 g/m^2 (34 kg or 11 lb) 40-64 g/m^2 (34-55 kg or 11-17 lb)
	Top Middle (2-8p) Bottom	40 g/m^2 (34 kg or 11 lb) 40 g/m^2 (34 kg or 11 lb) 40-64 g/m^2 (34-55 kg or 11-17 lb)
Carbon-interleaved	*Avoid using carbon-interleaved single sheets.*	
	Top Carbon Bottom	35-52 g/m^2 (30-45 kg or 9-14 lb) Counted as one sheet 35-81 g/m^2 (30-70 kg or 9-22 lb)
	Top Carbon Middle Carbon Bottom	35-46 g/m^2 (30-40 kg or 9-12 lb) Counted as one sheet 35-46 g/m^2 (30-40 kg or 9-12 lb) Counted as one sheet 35-64 g/m^2 (30-55 kg or 9-17 lb)
	Top Carbon Middle (3,5P) Carbon (4,6P) Bottom	35-46 g/m^2 (30-40 kg or 9-12 lb) Counted as one sheet 35-46 g/m^2 (30-40 kg or 9-12 lb) Counted as one sheet 35-64 g/m^2 (30-55 kg or 9-17 lb)
	Top Carbon Middle (3,5,7P) Carbon (4,6,8P) Bottom	35-46 g/m^2 (30-40 kg or 9-12 lb) Counted as one sheet 35-46 g/m^2 (30-40 kg or 9-12 lb) Counted as one sheet 35-64 g/m^2 (30-55 kg or 9-17 lb)

kg: Weight in kilograms of 1000 sheets of 788 × 1091 mm paper (1.16 g/m^2)

lb: Weight in pounds of 500 sheets of 17 × 22 inch paper (3.76 g/m^2)

C

COMMAND SETS

This appendix describes printer commands and their parameters.

This printer has three resident command sets:

- Fujitsu DPL24C PLUS (native command set for Fujitsu DL series printers)
- IBM Proprinter XL24E
- Epson ESC/P2

Separate programmer s manuals are available for these emulations. See Appendix A for order information.

Select the same emulation on the printer and in your software. If your software emulations include DPL24C PLUS, select DPL24C PLUS for optimum performance.

FUJITSU DPL24C PLUS

This section describes the printer commands for the DPL24C PLUS command set which is the native command set of this printer. See the Programmer's Manual (DPL24C PLUS) for detailed information on using these commands.

Function	Command
Print Mode Control	
Double-strike (bold) printing on	ESC G
Double-strike (bold) printing off	ESC H
Emphasized (shadow) printing on	ESC E
Emphasized (shadow) printing off	ESC F
Italic printing on	ESC 4
Italic printing off	ESC 5
Select character style and screening	ESC e S (n_1) (n_2)
n_1= 0:Normal	
1:Outline	
2:Shaded	
3:Outline and shaded	
4:Thin outline	
5:Thin shaded	
6:Thin outline and shaded	
n_2= 0:Transparent	
1:Light dot matrix	
2:Heavy dot matrix	
3:Vertical bars	
4:Horizontal bars	
5:Slants	
6:Back slants	
7:Lattice	
One-line double width characters on	SO or ESC SO
One-line double width characters off	DC 4
Double width characters on/off	ESC W (n)
(on: n = 1, off: n = 0)	

Function	Command
Double-height characters on/off (on: n = 1, off: n = 0) This command does not adjust the line spacing.	ESC V (n)
Multiwidth and height printing n = 0: Not adjusted 1: Character pitch multiplied 2: Line spacing multiplied 3: Character pitch and line spacing multiplied h_1: Tens digit of horizontal multiple h_2: Units digit of horizontal multiple v_1: Tens digit of vertical multiple v_2: Units digit of vertical multiple ($0 \leq h_1h_2$ or $v_1v_2 \leq 11$)	ESC u (n) (h_1) (h_2) (v_1) (v_2)
Condensed characters on	SI or ESC SI
Condensed characters off	DC2
Subscript or superscript printing on (subscript: n = 1, superscript: n = 0)	ESC S (n)
Subscript and superscript printing off	ESC T
Select underline type n = 0:Single line 1:Bold single line 2:Extremely bold single line 3:Double line 4:Bold double line 5:Extremely bold double line	ESC e U (n)
Underline on/off (on: n=1, off: n=0)	ESC- (n)
Overline on/off (on: n=1, off: n=0)	ESC e o (n)

Function	Command
Select printing style This command allows you to combine various printing styles. The value of n is the sum of the values of the styles you want to combine. n= 0:Pica pitch 1:Elite pitch 4:Condensed 8:Shadow 16:Bold 32:Double width 64:Proportional	ESC ! (n)
Select image overlay type This command allows you to overlay a pattern on characters. n= 1:Light dot matrix 2:Heavy dot matrix 3:Vertical bars 4:Horizontal bars 5:Slants 6:Back slants 7:Lattice	ESC e I (n)
Image overlay printing on/off (on:n=1, off: n=0)	ESC e L (n)
Horizontal Control	
Space	SP
Backspace	BS
Carriage return	CR
Elite pitch (12 cpi)	ESC M
Pica pitch (10 cpi)	ESC P
Proportionally spaced characters on/off (on:n=1, off: n=0)	ESC p (n)
Set character pitch to (n-1)/120 inch ($1 \leq n \leq 127$)	ESC US (n)
Set character pitch to n/180 inch ($0 \leq n \leq 255$)	ESC h (n)

Function	Command
Set character offset to n/120 inch Cancelled by CR or ESC x. $(0 \leq n \leq 63)$ $(64 \leq n \leq 127)$	ESC DC1 (n)
Set character pitch to n/360 inch $(0 \leq n_1\, n_2\, n_3 \leq 999)$ n_1, n_2, and n_3 are the hundreds, tens, and units digits.	ESC e H (n_1) (n_2) (n_3)
Vertical Control	
Line feed	LF
Reverse line feed	LF ESC
Form feed	FF
Advance paper n/180 inch $(0 \leq n \leq 255)$	ESC J (n)
Reverse paper n/180 inch $(0 \leq n \leq 255)$	ESC j (n)
Advance paper n/360 inch $(0 \leq n_1\, n_2\, n_3 \leq 999)$ n_1, n_2, and n_3 are the hundreds, tens, and units digits.	ESC e J (n_1) (n_2) (n_3)
Reverse paper n/360 inch $(0 \leq n_1\, n_2\, n_3 \leq 999)$ n_1, n_2, and n_3 are the hundreds, tens, and units digits.	ESC e j (n_1) (n_2) (n_3)
Set line spacing to 1/8 inch (8 lpi)	ESC 0
Set line spacing to n/180 inch $(0 \leq n \leq 255)$	ESC 3 (n)
Set line spacing to 7/60 inch	ESC 1
Set line spacing to n/60 inch $(0 \leq n \leq 127)$	ESC A (n)
Set line spacing to 1/6 inch (6 lpi) or to the value set with the ESC A command. The preset line spacing command is ESC A (n).	ESC 2
Set line spacing to n/360 inch $(0 \leq n_1\, n_2\, n_3 \leq 999)$ n_1, n_2, and n_3 are the hundreds, tens, and units digits.	ESC e V (n_1) (n_2) (n_3)
Set line spacing to n/360 inch $(1 \leq n \leq 255)$	FS 3 (n)

Function	Command
Tabulation	
Horizontal tab execution	HT
Set horizontal tabs	ESC D (n_1) ... (n_k)
The values of n_1 to n_k in this command are the ASCII values of the print columns (at the current character width) at which tabs are to be set. ($1 \leq n \leq 255$) ($1 \leq k \leq 255$)	NUL
Move to print column n ($1 \leq n \leq 255$)	ESC HT (n)
Move dot column n/360 inch ($n = n_1 + n_2 \times 256$) The value below is for 136-column printers. ($0 \leq n_1 \leq 255$) ($0 \leq n_2 \leq 19$) ($0 \leq n_2 \times 256 + n_1 \leq 4895$)	ESC $ (n_1) (n_2)
Horizontal relative move by n/360 inch ($-999 \leq n_1\, n_2\, n_3 \leq +999$) n_1, n_2, and n_3 are the hundreds, tens, and units digits of the distance.s is a plus or minus (+ or -) sign.	ESC e R (s) (n_1) (n_2) (n_3)
Vertical tab execution	VT
Set vertical tabs	ESC B (n_1) ... (n_k)
The values of n_1 to n_k in this command are the ASCII values of the lines (at the current line spacing) at which tabs are to be set. ($1 \leq n \leq 255$) ($1 \leq k \leq 64$)	NUL
Move to line n ($1 \leq n \leq 255$)	ESC VT (n)
Page Formatting	
Set right margin ($0 \leq n \leq 255$)	ESC Q (n)
Set left margin ($0 \leq n \leq 255$)	ESC 1 (n)
Set perforation skip by n lines ($1 \leq n \leq 127$)	ESC N (n)
Perforation skip off	ESC O
Set page length to n lines ($1 \leq n \leq 127$)	ESC C (n) or ESC FF (n)

Function	Command
Set page length to n inches $(1 \leq n \leq 22)$	ESC C NUL (n) or ESC e C NUL (n) or ESC FF NUL (n)
Set page length to n/360 inch $(n = n_1 \times 256 + n_2)$ $(0 \leq n_1\ n_2 \leq 255)$ $(1 \leq n_1 \leq 256 + n_2 \leq 7920)$	ESC e f (n_1) (n_2)
Character Set Control	
Select character set 1 Appendix E gives the character sets	ESC 7
Select character set 2 Appendix E gives the character sets.	ESC 6
Select international character set n = 0:USA 1:France 2:Germany 3:United Kingdom 4:Denmark 1/Norway 5:Sweden/Finland 6:Italy 7:Spain 8:Denmark 2	ESC R (n)
Clear print buffer	CAN
Select printer	DC1
Deselect printer (ignore input)	DC3
Force most significant bit to 1	ESC >
Force most significant bit to 0	ESC =
Cancel control over most significant bit	ESC #

<table>
<tr><th>Function</th><th>Command</th></tr>
<tr><td>Select code table
n = 0:Code page 437
1:Code page 850
2:Code page 860
3:Code page 863
4:Code page 865
5:ISO 8859-1/ECMA 94
Select extended character by character number
($0 \leq n_1\, n_2\, n_3 \leq 664$)
n_1, n_2, and n_3 are the hundreds, tens, and units digits.</td><td>ESC e C (n)

ESC e E
(n_1) (n_2) (n_3)</td></tr>
<tr><td>Word Processing
Line justification on
Automatically center printing
Reset word processing features</td><td>
ESC m
ESC c
ESC x</td></tr>
<tr><td>Font Selection and Downloading
Select font m with source and style set by n
• m (bits 0 and 1: Font device selection)
<table><tr><th>Bit 1</th><th>Bit 0</th><th>Selection of font</th></tr><tr><td>0</td><td>0</td><td>Resident font</td></tr><tr><td>0</td><td>1</td><td>Downloaded font</td></tr><tr><td>1</td><td>0</td><td>Resident font</td></tr></table>• m (bits 2 and 3: Print quality specification
<table><tr><th>Bit 3</th><th>Bit 2</th><th>Print quality</th></tr><tr><td>0</td><td>0</td><td>Original quality of font</td></tr><tr><td>0</td><td>1</td><td>Letter quality (360 dpi)</td></tr><tr><td>1</td><td>0</td><td>Correspondence quality (180 dpi)</td></tr><tr><td>1</td><td>1</td><td>Draft quality (120 dpi)</td></tr></table></td><td>ESC % (m) (n)</td></tr>
</table>

<table>
<tr><th>Function</th><th>Command</th></tr>
<tr><td>
• n (bit 0 to 2: Specification of font number)
(1) Resident fonts
<table>
<tr><th>n</th><th>m (bit 1, 0) = 0, 0</th><th>m (bit 1, 0) = 1, 0</th></tr>
<tr><td>0</td><td>Courier 10</td><td>OCR-B</td></tr>
<tr><td>1</td><td>Prestige elite 12</td><td>OCR-A</td></tr>
<tr><td>2</td><td>Draft</td><td></td></tr>
<tr><td>3</td><td>Compressed</td><td></td></tr>
<tr><td>4</td><td>Boldface PS</td><td></td></tr>
<tr><td>5</td><td>Pica 10</td><td></td></tr>
<tr><td>6</td><td>Correspondence</td><td></td></tr>
<tr><td>7</td><td>High-speed draft</td><td></td></tr>
</table>
(2) Downloaded fonts
n = 0: Downloaded font 0
1: Downloaded font 1
</td><td></td></tr>
<tr><td>Select print quality (font attributes)
n = 0:Letter (360 × 180 dpi)
1:Correspondence (180 × 180 dpi)
2:Draft (120 × 180 dpi)
3:High-speed Draft (90 × 180 dpi)</td><td>ESC e q (n)</td></tr>
<tr><td>Select spacing mode (font attributes)
n = 0:Fixed pitch font
1:Proportional spacing font</td><td>ESC e s (n)</td></tr>
<tr><td>Select character pitch (n/360 inch, font attributes)
$(0 \leq n_1 \leq 255)$ $(1 \leq n_2 \leq 255)$
$(n = n_1 \times 256 + n_2)$
Ex.n = 36: 10 pitch
30: 12 pitch
24: 15 pitch
21: 17 pitch</td><td>ESC e p (n_1) (n_2)</td></tr>
<tr><td>Condense/enlarge vertically (font attributes)
n = 1:Executed
0:Not executed</td><td>ESC e A (n)</td></tr>
<tr><td>Select point size (n/1200 inch, font attributes)
$(0 \leq n_1 \leq 255)$ $(0 \leq n_2 \leq 255)$
$(n = n_1 \times 256 + n_2)$
Ex. n =166: 10 point</td><td>ESC e v (n_1) (n_2)</td></tr>
</table>

Function	Command
Select character style (font attributes) n = 0:Upright 1:Italic	ESC e i (n)
Select stroke weight (font attributes) n = 249:-7 (reserved) 251:-5 (reserved) 253:-3 (light) 0:0 (medium) 3:3 (bold) 5:5 (black) 7:7 (ultrablack)	ESC e w (n)
Select typeface (font attributes) n = 1:Pica 3:Courier (bitmap) 4:Nimbus Sans 5:Timeless 6:Gothic 8:Prestige 23:Boldface 130:OCR-A 131:OCR-B 134:Courier (scalable)	ESC e t (n)
Select font by I.D. (font attributes)	ESC e F (n)

n	Quality	Spacing	Pitch	Point	Typeface
1	LQ	Fixed	10 cpi	12 pt	Courier (bitmap)
2	LQ	Fixed	12 cpi	10 pt	Prestige
3	LQ	PS	-	12 pt	Boldface
4	LQ	Fixed	10 cpi	12 pt	Pica
9	LQ	Fixed	10 cpi	12 pt	OCR-A
10	LQ	Fixed	10 cpi		OCR-B
32	LQ	Fixed	10 cpi	12 pt	Courier (bitmap)
34	LQ	Fixed	12 cpi	12 pt	Gothic
128	LQ	PS	-	11pt	Timeless
129	LQ	PS	-	10 pt	Timeless Italic
130	LQ	PS	-	10 pt	Timeless Bold
132	LQ	PS	-	10 pt	Nimbus Sans ®
133	LQ	PS	-	10 pt	Nimbus Sans ® Italic
134	LQ	PS	-	10 pt	Nimbus Sans ® Bold
140	LQ	Fixed	10 cpi	10 pt	Courier (scalable)
141	LQ	Fixed	10 cpi	10 pt	Courier Bold (scalable)
142	LQ	Fixed	10 cpi	10 pt	Courier Italic (scalable)

<table>
<tr><th>Function</th><th>Command</th></tr>
<tr><td>Copy resident font to download area
m = 0:Courier 10
1:Prestige Elite 12
2:Draft
3:Compressed
4:Boldface PS
5:Pica 10
6:Correspondence
7:High-speed Draft
n = 0:Downloaded font 0
1:Downloaded font 1</td><td>ESC : NUL (m) (n)</td></tr>
<tr><td>Create download font
• m (bits 4 and 5: Specifies the quality of characters to be registered)
<table>
<tr><th>Bit 5</th><th>Bit 4</th><th>Font quality selection</th></tr>
<tr><td>0</td><td>1</td><td>Letter (360 dpi)</td></tr>
<tr><td>1</td><td>0</td><td>Correspondence (180 dpi)</td></tr>
<tr><td>1</td><td>1</td><td>Draft (120 dpi)</td></tr>
</table>
• m (bit 0: Specifies external font number to be registered)
<table>
<tr><th>Bit 0</th><th>Font number selection</th><th>Remarks</th></tr>
<tr><td>0</td><td>Downloaded font 0</td><td>At power on, resident font 0 is automatically downloaded.</td></tr>
<tr><td>1</td><td>Downloaded font 1</td><td>At power on, resident font 1 is automatically downloaded.</td></tr>
</table>
• m (bits 1, 2, 3, 6, 7) Not used (don’t care)
• Cs (Download start character, ASCII code)
• Ce (Download end character, ASCII code)
<table>
<tr><td>Decimal</td><td>00 ≤ Cs, Ce < 255</td></tr>
<tr><td>Hex</td><td>00 ≤ Cs, Ce ≤ FF</td></tr>
</table>
Precaution: Ce ≥ Cs
• data (More than one byte of data containing bit map data)
(Reserved)</td><td>ESC & (m) (Cs) (Ce) (data)

ESC e D (data);</td></tr>
</table>

Function	Command
Bit Image Graphics	
Graphics type m graphics	ESC * (m)
	(n_1) (n_2) (data)
Graphics type m graphics	ESC e b (m)
	(n_1) (n_2) (data) or
	ESC e B (m)
	(n_1) (n_2) (data)
Single-density graphics	ESC K (n_1) (n_2) (data)
Double-density graphics	ESC L (n_1) (n_2) (data)
High-speed double-density graphics	ESC Y (n_1) (n_2) (data)
Quadruple-density graphics	ESC Z (n_1) (n_2) (data)
360 dot per inch 24-pin graphics	FS Z (n_1) (n_2) (data)
Cut Sheet Feeder Control	
Feed a sheet from bin 1	ESC EM 1
Feed a sheet from bin 2	ESC EM 2
Feed a sheet from bin 3	ESC EM E
Eject a page from the printer	ESC EM R
Select bin 1 for following pages	/ / 1 / /
Select bin 2 for following pages	/ / 2 / /
Select bin 3 for following pages	/ / E / /
Initialize Printer	
Reset printer	ESC @
Reset printer	ESC CR P
Initialize printer	ESC SUB I

Function	Command
Bar Code Printing Print bar code b: Total number of parameters R: (fixed) c: Type of bar code	ESC DC4 (b) R (c) (w) (h) (a) (ch_1) ... (ch_n)

ASCII	Decimal	Hex	Type
1	49	31	Codabar (nw-7)
2	50	32	EAN 13
3	51	33	EAN 8
4	52	34	Code 3 of 9
5	53	35	Industrial 2 of 5
6	54	36	Interleaved 2 of 5
7	55	37	Matrix 2 of 5
A	65	41	UPC type A
B	66	42	Code 128
a	97	61	UPC type A with checkdigit printing

w: Width of narrow bar in 1/1440-inch units
h: Height of bar code
a: Defines check characters and OCR characters
ch_1 ... ch_n: Bar code characters

NOTE

When EAN13, UPC type A, or UPC type A with checkdigit printing is selected as the type of barcode, printing the barcode from the left (from the first dot) will cause the omission of a flag character that should by printed on the lower left or middle left of it. Therefore, when printing these types of barcode, leave two or more spaces open from the left.

See the next page for details of the Bar Code Command.

Bar Code Printing Control

ASCII : ESC + DC4 + b + R + c + w + a + ch1 … + chn
Hexadecimal : 1B + 14 + b + 52 + c + w + a + ch1 … + chn
Decimal : 27 + 20 + b + 82 + c + w + a + ch1 … + chn

(1) Function

(a) Instructs the printing of bar codes according to the different specifications of this command.

(2) Valid range of parameters

(a) **b** (Specification of number of bytes) = Actual number of data + 6

(b) **R** (Fixed)

ASCII : R
Hexadecimal : 82
Decimal : 52

(c) **C** (Specifies the type of bar code to be printed. No printing is done if any value other than the following is specified.)

C			Type of bar code
ASCII	**Decimal**	**Hexadecimal**	
1	49	31	Codabar (nw-7)
2	50	32	EAN 13
3	51	33	EAN 8
4	52	34	Code 3 of 9
5	53	35	Industrial 2 of 5
6	54	36	Interleaved 2 of 5
7	55	37	Matrix 2 of 5
A	65	41	UPC type A
B	66	42	CODE 128
a	97	61	UPC type A with check character

(d) **w** (Specify the width of the narrow bar of the bar code to be printed in units of 1/1440.)
Specify the "Logical value" to be printed (in units of 1/1440).
Actual printing: The printer prints with the width given in the following table in units of 1/180 inches.

w	Width of narrow bar
1 ~ 19	2 Dots (2/180 inches)
20 ~ 27	3 Dots (3/180 inches)
28 ~	4 Dots (4/180 inches)

(e) **h** (Specify the height of the bar code to be printed in units of 1/1440 taking the narrow bar width as the reference.)

Height of bar code $\fallingdotseq$ (parameter w) × (parameter h) [in units of 1/1440]
Height of bar code $\leq$ 11 Inches

Actual printing: The printing is done with the following initial values if the bar code height is less than or equal to 24 dots taking 1 dot equal to 1/180 inches of the printing unit of the printer.

The following values are the standard heights for the respective bar code standards. Enter the value so that the height is ≤ 23/180 if the standard is correct.

Narrow bar width	EAN 13/UCP-A	EAN 8	Others
2 Dots (16/1440)	162 Dots (1296/1440)	130 Dots (1040/1040)	108 Dots (864/1440)
3 Dots (24/1440)	234 Dots (1872/1440)	187 Dots (1496/1040)	135 Dots (1080/1440)
4 Dots (32/1440)	312 Dots (2496/1440)	249 Dots (1992/1040)	162 Dots (1296/1440)

Figures in parentheses ( ) are values converted to units of 1/1440.

(f) **a** (Bits 2~0: Specifications related to the check and OCR characters.)

Bit	Content of specification	value	Content of setting
0	Check character Additional specification * 1	0	Added
		1	Not added
1	Specification of OCR character printing (OCR-B is taken as the standard)	0	Printed
		1	Not printed
2	Printing position of EAN, UPC flag character	0	To the left of the bar code
		1	To the bottom left of the bar code

*1: The specification becomes invalid for the following bar codes:
Codabar … Always the non-additional code is set.
EAN, UPC … Always the additional code is set.

*2: The flag character is printed when Bit 1 = 0.

(g) (ch1) … (chn)

The data and the printable character set are listed below.

Type of bar code	Usable character set	Data count
Codabar	Numerals: 0 ~ 9 Symbols; + -, $/: Start, Stop: A,a,B,b,C,c,D,d, T,t,N,n,*,E,e	1 ≤ n ≤ 64 Includes Start and Stop
EAN 13	Numerals: 0 ~ 9	Fixed at n=12
EAN 8	Numerals: 0 ~ 9	Fixed at n=7
Code 3 of 9	Numerals: 0 ~ 9 Alphabets: A ~ Z: Symbols: +-,$/%SPACE Start, Stop:*	Check character Additional code 1 ≤ n ≤ 63
Industrial 2 of 5	Numerals: 0 ~ 9	Check character Non-additional code 1 ≤ n ≤ 64
Interleaved 2 of 5	Numerals: 0 ~ 9	
Matrix 2 of 5	Numerals: 0 ~ 9	
UPC Type A	Numerals: 0 ~ 9	Fixed at n=11
UPC Type A with check character	Numerals: 0 ~ 9	Fixed at n=11
Code 128	ASCII Code Start code: A, B, C Code set C: 0 ~ 9	Check character Additional code 1 ≤ n ≤ 63 Check character Non-additional code 1 ≤ n ≤ 64 Code set C: 2n

Function	Command
Print Option Control	
Friction feed selection	/ / F / /
Rear tractor feed selection	/ / T / /
Front tractor feed selection	/ / M / /
Cut sheet feed selection	/ / S / /
Host controlled paper path control n = "F" :Friction "T" :Rear Tractor "M" : Front Tractor	ESC e T (n)
Automatic paper thickness control	ESC e P (n_1) (n_2) (n_3) (n_4)
Miscellaneous	
Sound bell	BEL
Enable paper-out sensor	ESC 9
Ignore paper-out sensor	ESC 8
Typewriter mode on/off (on:n=1, off: n=0)	ESC i (n)
Move print head to home position	ESC <
Unidirectional printing on/off (on:n=1, off: n=0)	ESC U (n)
Select CR code definition n = 0:CR = CR only 1:CR = CR + LF	ESC e r (n)
Select LF code definition n = 0:LF = LF only 1:LF = LF + CR	ESC e l (n)
Enter online setup mode	ESC e ONLINE (data)
Move print head (unit: 1/180 inch) ($0 < n_1 < 255$) ($0 < n_2 < 255$)	ESC e h (n_1) (n_2)

Factory Default Settings

The following table describes the printer commands used to control options of the items that can be selected in printer setup mode. Command parameters are omitted

Item	Selectable options in setup mode	Command
Emulate	DPL24C+, XL24E, ESC/P2	Controllable in online setup mode
Font	COUR 10, PRSTG 12, COMPRSD, BOLDFCE, PICA 10, CORRESP, COUR-N, COUR-B, COUR-I, TIMLS-N, TIMLS-B, TIMLS-I, N.SAN-N, N.SAN-B, N.SAN-I. OCR-B, OCR-A, DOWNLD 0, DOWNLD 1	ESC e t ESC e F ESC %
Quality	LETTER, REPORT, DRAFT, HI-DRFT	ESC e q
Pitch	2.5, 3, 5, 6, 10, 12, 15, 17, 18, 20 CPI or PROP SP	ESC e p ESC e H ESC h ESC US ESC M ESC P ESC p ESC i ESC e s
Line space	1, 2, 3, 4, 5, 6, 7, 8, LPI	ESC e V ESC 0 ESC 1 ESC 2 ESC 3 ESC A
Character width	NORMAL, 2 TIMES, 4 TIMES	ESC W SO or ESC SO (DC4) ESC u ESC !
Character height	NORMAL, 2 TIMES, 4 TIMES	ESC V ESC u

Underline: Factory default

( ): Cancel command

Item	Selectable options in setup mode	Command
Attributes	NONE, ITALICS, CONDNSD, SHADOW, BOLD	ESC 4 (ESC 5) SI or ESC SI (DC2) ESC E (ESC F) ESC G (ESC H) ESC e i ESC !
Page length	3.0, 3.5, 4.0, 5.0, 5.5, 6.0, 7.0, 8.0, 8.5, 11.0, 11.6, 12.0, 14.0, 18.0 IN	ESC C NUL ESC e C NUL ESC FF NUL ESC C ESC e C ESC FF
Left end	1 , 2, 3, ... , 41 COLM	Controllable in online setup mode
Top margin	1 , 2, 3, ... , 10 LINE	Controllable in online setup mode
Language	USA, UK, GERMAN, FRENCH, ITALIAN, SPANISH, SWEDISH, FINNISH, DANISH1, DANISH2, NORWEGN, PAGE437, PAGE850, PAGE860, PAGE863, PAGE865 ISO8859, ECMA94	ESC R ESC e C
	PG852, PG852-T, PG855, PG866, HUNGARY, HUNG-T, SOLV, SOLV-T, POLISH, POLSH-T, MAZOWIA, MAZOW-T, LATIN7, LATIN2, LATN2-T, KAMENIC, KAMEN-T, TURKY, TURKY-T, CYRILIC, IBM437, IBM851, ELOT928, PG-DHN, LATIN-P, ISO-LTN, LITHUA1, LITHUA2, MIK, MACEDON, ABG, ABY, PG-MAC, ELOT927, DEC-GR, GREEK 11, PG862, HBR-OLD, HBR-DEC, ISO-TUK, RUSCII, LATIN-9 , WCP1250, WCP1251, WCP1252	Uncontrollable by commands but controllable in online setup mode

Underline: Factory default

( ): Cancel command

Item	Selectable options in setup mode	Command
Character set	SET 1, SET2	ESC7 ESC6
Perfora-tion skip	SKIP, NO-SKIP	ESC N (ESC O)
Paper width	8.0 IN, 11.0 IN, 11.4 IN, 13.6IN, (8.0 IN is default for 80-column printer, and 13.6 IN is default for 136-column printer)	Controllable in online setup mode
Zero font	NO-SLSH, SLASH	Controllable in online setup mode
DC3	ENABLE, DISABLE	Controllable in online setup mode
CR code	CR-ONLY, CR & LF	ESC e r
LF code	LF-ONLY, LF & CR	ESC e l
Right end wrap	WRAP, OVR-PRT	Controllable in online setup mode
Paper-out	CNTONLY, DETECT, IGNORE	ESC 9 (ESC 8)
Print direction	BI-DIR, UNI-DIR	ESC U
Print mode	NORMAL, QUIET	Controllable in online setup mode
High Impact	DISABLE, ENABLE	Controllable in online setup mode

Underline: Factory default

( ): Cancel command

IBM PROPRINTER XL24E EMULATION

This section describes the printer commands for the IBM Proprinter XL24E emulation. Asterisks in the "Function" column indicate extended commands that are not supported by the original printer.

<table>
<tr><th>Function</th><th>Command</th></tr>
<tr><td>Print Mode Control</td><td></td></tr>
<tr><td>Double-strike (bold) printing on</td><td>ESC G</td></tr>
<tr><td>Double-strike (bold) printing off</td><td>ESC H</td></tr>
<tr><td>Emphasized (shadow) printing on</td><td>ESC E</td></tr>
<tr><td>Emphasized (shadow) printing off</td><td>ESC F</td></tr>
<tr><td>One-line double-width characters on</td><td>SO or ESC SO</td></tr>
<tr><td>One-line double-width characters off</td><td>DC4</td></tr>
<tr><td>Double-width characters on/off</td><td>ESC W (n)</td></tr>
<tr><td>(on: n = 1, off: n = 0)</td><td></td></tr>
<tr><td>Double-height/double-width characters</td><td>ESC [@ (n_1)(n_2)</td></tr>
<tr><td>$n_1 = 4$, $n_2 = 0$, $m_1 = 0$, $m_2 = 0$</td><td>(m_1) ... (m_4)</td></tr>
<tr><td>m_3 controls character height and line spacing:
<table>
<tr><th>m_3</th><th>Height</th><th>Spacing</th></tr>
<tr><td>0</td><td>Unchanged</td><td>Unchanged</td></tr>
<tr><td>1</td><td>Normal</td><td>Unchanged</td></tr>
<tr><td>2</td><td>Double</td><td>Unchanged</td></tr>
<tr><td>16</td><td>Unchanged</td><td>Single</td></tr>
<tr><td>17</td><td>Normal</td><td>Single</td></tr>
<tr><td>18</td><td>Double</td><td>Single</td></tr>
<tr><td>32</td><td>Unchanged</td><td>Double</td></tr>
<tr><td>33</td><td>Normal</td><td>Double</td></tr>
<tr><td>34</td><td>Double</td><td>Double</td></tr>
</table>
m_4 controls character width:
<table>
<tr><th>m_3</th><th>Height</th></tr>
<tr><td>0</td><td>Unchanged</td></tr>
<tr><td>1</td><td>Normal</td></tr>
<tr><td>2</td><td>Double</td></tr>
</table>
</td><td></td></tr>
</table>

Function	Command
Condensed characters on	SI or ESC SI
Condensed and elite characters off	DC2
Subscript or superscript printing on (subscript: n = 1, superscript: n = 0)	ESC S (n)
Subscript and superscript printing off	ESC T
Underline on/off (on: n = 1, off: n = 0)	ESC - (n)
Overline on/off (on: n = 1, off: n = 0)	ESC_(n)
Horizontal Control	
Space	SP
Backspace	BS
Carriage return	CR
Elite characters on	ESC:
Proportionally spaced characters on/off (on:n= 1, off: n= 0)	ESC P (n)
Vertical Control	
Line feed	LF
Form feed	FF
Advance papern/216 inch ($1 \leq n \leq 255$)	ESC J (n)
Advance papern/180 inch (in AG mode) ($1 \leq n \leq 255$)	ESC J (n)
Set line spacing to 1/8 lines	ESC 0
Set line spacing to 7/72 inch	ESC 1
Set line spacing to n/216 inch ($0 \leq n \leq 255$)	ESC 3 (n)
Set line spacing to n/180 inch (in AG mode) ($0 \leq n \leq 255$)	ESC 3 (n)
Preset line spacing to n/72 inch ($1 \leq n \leq 255$)	ESC A (n)
Preset line spacing to n/60 inch (in AG mode) ($1 \leq n \leq 255$)	ESC A (n)
Set line spacing to 1/6 inch or to the value preset by line spacing command ESC A (n)	ESC 2

Function	Command
Change graphics line spacing base to 1/216 or 1/180 inch (for ESC J and ESC 3) $m_1 = 4$, $m_2 = 0$ $0 \leq t_1 \leq 255$, $0 \leq t_2 \leq 255$, $t_3 = 0$ $t_4 = 180$ or 216	ESC [\ (m_1) (m_2) (t_1) ... (t_4)
Tabulation	
Horizontal tab execution	HT
Set horizontal tabs The values of n_1 to n_k in this command are the ASCII values of the print columns (at the current character width) at which tabs are to be set. ($1 \leq n \leq 255$) ($1 \leq k \leq 28$)	ESC D (n_1)... (n_k) NUL
Clear all horizontal tabs	ESC D NUL
Move print position right by n/120 inch ($0 \leq n_1, n_2 \leq 255$) ($n = n_1 + n_2 \times 256$)	ESC d (n_1)(n_2)
Vertical tab execution	VT
Set vertical tabs The values of n_1 to n_k in this command are the ASCII values of the lines (at the current line spacing) at which tabs are to be set. ($1 \leq n \leq 255$) ($1 \leq k \leq 64$)	ESC B (n_1)... (n_k) NUL
Clear all vertical tabs	ESC B NUL
Reset tabs to default values	ESC R
Page Formatting	
Set left margin at column n and right margin at column m ($0 \leq n, m \leq 255$)	ESC X (n) (m)
Set perforation skip by n lines ($1 \leq n \leq 255$)	ESC N (n)
Perforation skip off	ESC O
Set page length to n lines ($1 \leq n \leq 255$)	ESC C (n)
Set page length to n inches ($1 \leq n \leq 22$)	ESC C NUL (n)
Set top of form	ESC 4

Function	Command
Character Set Control	
Select character set 1	ESC 7
Select character set 2	ESC 6
Print $n_1 + n_2 \times 256$ characters from all-character set (chars.: codes of characters to print, $0 \leq$ chars. ≤ 255)	ESC \ $(n_1)(n_2)$ (chars.)
Print a character from all-character set (char.: a code of character to print, $0 \leq$ char. ≤ 255)	ESC ^ (char.)
Select code page table n $(0 \leq n_1, n_2 \leq 255)$ $(n = n_1 + n_2 \times 256)$	ESC [T $(n_1)(n_2)$ 0 0 $(c_1)(c_2)$
Clear input buffer	CAN
Select printer	DC1
Deselect printer (ignore input)	ESC Q #

c_1	c_2	Code page ID
0	0	Ignore command
1	181	Code page 437
3	82	Code page 850
3	92	Code page 860
3	95	Code page 863
3	97	Code page 865

Function	Command
Downloading	
Select resident or downloaded font	ESC I (n)
Ex.n = 0:Resident Draft	
2:Resident Courier	
4:Downloaded Draft	
6:Downloaded Courier	ESC = (n_1) (n_2)
Create download font	ID (m_1) (m_2) (data)
Bit Image Graphics	
Single-density graphics	ESC K (n_1)(n_2) (data)
Double-density graphics	ESC L (n_1)(n_2) (data)
High-speed double-density graphics	ESC Y (n_1)(n_2) (data)
Quadruple-density graphics	ESC Z (n_1)(n_2) (data)
High-resolution graphics	ESC [g (n_1)(n_2) (m) (data)
Select graphics mode (in AG mode only)	ESC * (m) (c_1) (c_2) (data)
Cut Sheet Feeder Control	
Feed a sheet from bin 1	ESC EM 1
Feed a sheet from bin 2	ESC EM 2
Feed a sheet from bin 3	ESC EM E
Eject a page from the printer	ESC EM R
Select bin 1 for following pages	/ / 1 / /
Select bin 2 for following pages	/ / 2 / /
Select bin 3 for following pages	/ / E / /
Change bins at next page	/ / C / /
Print Option Control	
Friction feed selection	/ / F / /
Rear tractor feed selection	/ / T / /
Front tractor feed selection	/ / M / /
Cut sheet feed selection	/ / S / /
Miscellaneous	
Sound the bell	BEL
Unidirectional printing on/off (on:n= 1, off:n= 0)	ESC U (n)
Add a carriage return to all line feeds (on:n= 1, off:n= 0)	ESC 5 (n)
Printer offline	ESC j
Enter online setup mode	ESC e ONLINE (data)
Select default settings	ESC [K (n_1)(n_2) (i) (ID) (p_1)(p_2)

EPSON ESC/P2 EMULATION

This section describes the printer commands for the Epson ESC/P2 emulation. Asterisks in the "Function" column indicate extended commands that are not supported by the original printer.

Function	Command
Print Mode Control	
Double-strike (bold) printing on	ESC G
Double-strike (bold) printing off	ESC H
Emphasized (shadow) printing on	ESC E
Emphasized (shadow) printing off	ESC F
Italic printing on	ESC 4
Italic printing off	ESC 5
Select character style	ESC q (n)
n =0: Normal	
1: Outlined	
2: Shaded	
3: Outlined and shadowed	
One-line double-width characters on	SO or ESC SO
One-line double-width characters off	DC4
Double-width characters on/off	ESC W (n)
(on: n= 1, off: n= 0)	
Double-height characters on/off	ESC w (n)
(on: n= 1, off: n= 0)	
Condensed characters on	SI or ESC SI
Condensed characters off	DC2
Subscript or superscript printing on	ESC S (n)
(subscript: n= 1, superscript: n= 0)	
Subscript and superscript printing off	ESC T
Underline on/off	ESC - (n)
(on: n= 1, off: n= 0)	

Function	Command
Select line $n_1 = 3$, $n_2 = 0$, $d_1 = 1$ $d_2 = 0$:Ignore command 1:Underline 2:Strike through 3:Overscore $d_3 = 0$ or 4:Cancel line selection 1:Single line 2 or 3:Double line 5:Single-dotted line 6 or 7:Double-dotted line	ESC (- $(n_1)(n_2)$ (d_1) (d_2) (d_3)
Select printing style This command allows you to combine various printing styles. The value of n is the sum of the values of the styles you want to combine. n = 0:Pica pitch 1:Elite pitch 2:Proportional spacing 4:Condensed 8:Shadow 16:Bold 32:Double-width 64:Italics 128:Underline	ESC ! (n)
Horizontal Control	
Space	SP
Backspace	BS
Carriage return	CR
Set elite pitch	ESC M
Set pica pitch	ESC P
Set 15 CPI	ESC g
Proportionally spaced characters on/off (on: n = 1, off: n = 0)	ESC p (n)
Set inter-character space to n/120 inch (for draft) or n/180 inch (for letter and proportional) ($0 \leq n \leq 127$)	ESC SP (n)

Function	Command
Set character pitch to $(n_1+ n_2 \times 256)/360$ inch $(0 \leq n_1 \leq 255)$ $(0 \leq n_2 \leq 4)$	ESC c $(n_1)(n_2)$
Select character pitch (specify unit of pitch) $n_1 = 1$, $n_2 = 0$ d = 10 to 19: 10/3600 inch = 1/360 inch d = 20 to 29: 20/3600 inch = 1/180 inch d = 30 to 39: 30/3600 inch = 1/120 inch d = 40 to 49: 40/3600 inch = 1/90 inch d = 50 to 59: 50/3600 inch = 1/72 inch d = 60 to 69: 60/3600 inch = 1/60 inch	ESC (U $(n_1)(n_2)$ (d)
Vertical Control	
Line feed	LF
Form feed	FF
Advance paper n/180 inch $(1 \leq n \leq 255)$	ESC J (n)
Set line spacing to 1/8 inch	ESC 0
Set line spacing to n/180 inch $(0 \leq n \leq 255)$	ESC 3 (n)
Set line spacing to n/60 inch $(0 \leq n \leq 127)$	ESC A (n)
Set line spacing to 1/6 inch	ESC 2
Set line spacing to n/360 inch $(0 \leq n \leq 255)$	ESC + (n)
Tabulation	
Horizontal tab execution	HT
Set horizontal tabs	ESC D
The values of n_1 to n_k in this command are the ASCII values of the print columns (at the current character width) at which tabs are to be set. $(1 \leq n \leq 255)$ $(1 \leq k \leq 32)$	(n_1)... (n_k) NUL
Move print position n/120 inch (for draft)(*1) or n/180 inch (for letter)(*1) right from left margin $(n = n_1+ n_2 \times 256)$	ESC \$ $(n_1)(n_2)$
Move print position n/120(*1) inch (for draft) Or n/180(*1) inch (for letter) left or right from the current position $(n = n_1+ n_2 \times 256)$	ESC \ $(n_1)(n_2)$
Vertical tab execution	VT

Function	Command
Set vertical tabs The values of n_1 to n_k in this command are the ASCII values of the lines (at the current line spacing) at which tabs are to be set. ($1 \leq n \leq 255$) ($1 \leq k \leq 16$)	ESC B (n_1)... (n_k) NUL
Move to dot line $(d_1 + d_2 \times 256)/360^{(*1)}$ inch $n_1 = 2$, $n_2 = 0$ ($0 \leq d_1 \leq 255$) ($0 \leq d_2 \leq 127$)	ESC (V (n_1) (n_2) (d_1) (d_2)
Vertical relative move by $(d_1 + d_2 \times 256)/360^{(*1)}$ Inch $n_1 = 2$, $n_2 = 0$ ($0 \leq d_1 \leq 255$) ($0 \leq d_2 \leq 127$) $-32768 \leq d_1 + d_2\ 256 \times 32768$	ESC (v (n_1) (n_2) (d_1) (d_2)
Page Formatting	
Set right margin to column n ($1 \leq n \leq 255$)	ESC Q (n)
Set left margin to column n ($0 \leq n \leq 255$)	ESC l (n)
Set top and bottom margins from top of page $n_1 = 4$, $n_2 = 0$ • Top margin = $(t_1 + t_2 \times 256)/360^{(*1)}$ inch ($0 \leq t_1 \leq 255$) ($0 \leq t_2 \leq 127$) • Bottom margin = $(b_1+b_2 \times 256)/360^{(*1)}$ inch ($0 \leq b_1 \leq 255$) ($0 \leq b_2 \leq 127$)	ESC (c (n_1) (n_2) (t_1) (t_2) (b_1) (b_2)
Set perforation skip by n lines ($1 \leq n \leq 127$)	ESC N (n)
Perforation skip off	ESC O
Set page length to n lines ($1 \leq n \leq 127$)	ESC C (n)
Set page length to n inches ($1 \leq n \leq 22$)	ESC C NUL (n)
Set page length to $(d_1 + d_2 \times 256)/360^{(*1)}$ inch $n_1 = 2$, $n_2 = 0$ ($0 \leq d_1 \leq 255$) ($0 \leq d_2 \leq 127$)	ESC (C (n_1) (n_2) (d_1) (d_2)

*1 The value depends on the pitch set by the ESC (U command. The default is 1/360 inch.

Function	Command
Character Set Control	
Select character set 1	ESC 7
Select character set 2	ESC 6
Select character set table	ESC t (n)
n = 0:Italics character set	
1:Graphics character set	
2:Downloaded character set	
3:Graphics character set	
Select international character set	ESC R (n)
n = 0:USA	
1:France	
2:Germany	
3:United Kingdom	
4:Denmark 1	
5:Sweden	
6:Italy	
7:Spanish 1	
8:Japan	
9:Norway	
10:Denmark 2	
11:Spanish 2	
12:Latin America	
13:Korea	
64:Legal	

Function	Command
Assign a character set to active character set number 0 to 3 $n_1 = 3, n_2 = 0$ d_1 = 0:Active character set number 0 1:Active character set number 1 2:Active character set number 2 3:Active character set number 3 d_2 = 0:Italic 1:PC 437 (USA) 3:PC 850 (Multilingual) 7:PC 860 (Portugal) 8:PC 863 (Canada-French) 9:PC 865 (Norway) $d_3 = 0$	ESC (t (n_1) (n_2) (d_1) (d_2) (d_3)
Print $n_1 + n_2 \times 256$ characters from all-character set $(0 \leq n_1 \leq 255)$ $(0 \leq n_2 \leq 127)$ $(0 \leq n_1 + n_2 \times 256 \leq 255)$ (0 character codes $\leq$ 254)	ESC (^ (n_1)(n_2) (character codes)
Clear input buffer	CAN
Delete a character	DEL
Force most significant bit to 1	ESC >
Force most significant bit to 0	ESC =
Cancel control over most significant bit	ESC #
Font Selection and Downloading	
Select font n = 0:Resident character set 1:Downloaded character set	ESC % (n)
Select letter or draft quality n = 0:Draft 1:Letter	ESC x (n)

Function	Command
Select type style • Bitmap font: n = 0:Courier 1:Courier 2:Courier 3:Prestige 4:Courier 5:OCR-B 6:OCR-A 7:Courier 8:Courier 9:Courier • Scalable font: n = 0:Timeless 1:Nimbus Sans ® 2:Courier 3:Timeless 4:Timeless 5:Timeless 6:Timeless 7:Timeless 8:Timeless 9:Timeless	ESC k (n)
Set scalable font mode • m sets character pitch. m = 0:Keep previous pitch 1:Set proportional space mode m ≥ 5:Select character pitch (m/360 inch) (Reset proportional space mode) • n_1 and n_2 set point size of font. Point size = $(n_1 + n_2 \times 256) \times 0.5$ point $(0 \leq n_1 \leq 255)$ $(0 \leq n_2 \leq 127)$	ESC X m $(n_1)(n_2)$
Copy resident character set to download area	ESC : NUL(n)(s)
Create download font	ESC & NUL $(n_1)(n_2)$ (d_0) (d_1) (d_2) (data)

* Indicates extended commands not supported by the original printer.

Function	Command
Bit Image Graphics	
Graphics type m graphics	ESC * (m) (n_1)(n_2) (data)
Bit image mode definition	ESC ? (s) (n)
Single-density graphics	ESC K (n_1)(n_2) (data)
Double-density graphics	ESC L (n_1)(n_2) (data)
High-speed double-density graphics	ESC Y (n_1)(n_2) (data)
Quadruple-density graphics	ESC Z (n_1)(n_2) (data)
Select raster image graphics $n_1 = 1$, $n_2 = 0$ d= 1: Raster image graphics mode	ESC (G (n_1)(n_2) (d)
Print raster image graphics	ESC . (c)(v) (h) (m) (n_1)(n_2) (data)
Cut Sheet Feeder Control	
Feed a sheet from bin 1	ESC EM 1
Feed a sheet from bin 2	ESC EM 2
Feed a sheet from bin 3	ESC EM E
Eject a page from the printer	ESC EM R
Select bin 1 for following pages	/ / 1 / /
Select bin 2 for following pages	/ / 2 / /
Select bin 3 for following pages	/ / E / /
Change bins at next page	/ / C / /
Print Option Control	
Friction feed selection	/ / F / /
Rear tractor feed selection	/ / T / /
Front tractor feed selection	/ / M / /
Cut sheet feed selection	/ / S / /
Miscellaneous	
Sound the bell	BEL
Move print head to home position	ESC <
Unidirectional printing on/off (on:n = 1, off:n = 0)	ESC U (n)
Initialize printer	ESC @
Enter online setup mode	ESC e ONLINE (data)

INTERFACE INFORMATION

D

This printer can communicate with a computer through a Centronics parallel interface, a RS-232C serial interface, a USB interface, or a LAN interface. You can specify the interface selection mode so that the printer uses which interface or it can automatically select the interface from which it first receives data.

This appendix provides information you may need for wiring your own interface cables or for programming computer-to-printer communications. Most users do not need the information in this appendix. To simply connect your printer to your computer, follow the instructions in Chapter 2.

PARALLEL INTERFACE

This parallel interface can operate in the following two modes:

- Unidirectional (forward channel) mode or conventional mode: This printer supports a conventional Centronics interface.
- Bidirectional (forward/reverse channel) mode or nibble mode: This printer supports a bidirectional communication per Nibble mode of the IEEE 1284 Standard.

The cable connector at the printer side should be a shielded, Amphenol DDK 57FE-30360 or equivalent.

The connector pin assignments are given in the following tables by modes. In the tables:

- "Input" denotes a signal from the computer to the printer.
- "Output" denotes a signal from the printer to the computer.
- The return lines specified in the second column represent twisted pairs, with one side connected to signal ground.
- The standard signal levels are 0.0 to +0.4 V (low), and +2.4 to +5.0 V (high).

Compatible Mode

Pin No.	Return Pin No.	Signal Name	Direction	Description
1	19	$\overline{\text{Data Strobe}}$ ($\overline{\text{DSTB}}$)	Input	This signal is a strobe pulse for reading data (Data 1 to 8). The printer reads data when this signal is low. The pulse width must be 1 μs or more at the receiving terminal.
2-9	20-27	Data 1 to 8	Input	Data 8 (pin 9) is the most significant bit; however, this pin is not used in 7-bit ASCII communications. Logical 1 signals must go high at least 1 μs before the falling edge of the $\overline{\text{Data Strobe}}$ signal and must stay high for at least 1 μs after the rising edge.
10	28	$\overline{\text{Acknowledge}}$ ($\overline{\text{ACK}}$)	Output	This pulse signal indicates that the printer has received data and is ready to accept the next set of data. This signal is also sent when the printer is switched from offline to online.
11	29	Busy	Output	Data cannot be received when this signal is high. This signal is high during data entry, when the printer is offline, when the buffer is full, or when an error occurs.
12	30	Paper Empty (PE)	Output	This signal is high when the printer is out of paper.

Pin No.	Return Pin No.	Signal Name	Direction	Description
13	–	Select (SLCT)	Output	This signal is high when the printer is online.
14	–	$\overline{\text{Auto Feed XT}}$	Input	Not used
15	–	–	–	No connection
16	–	Signal Ground	–	Logic ground level (0 V)
17	–	Frame Ground	–	Printer chassis ground line. FG and SG are connected.
18	–	+5 V	Output	+5 V source (up to 300 mA)
19-30	–	Signal Ground	–	Twisted pair return lines
31	–	$\overline{\text{Input Prime}}$ (INPRM)		If this signal is low for more (INPRM) than 50 μs, the printer is reset to the initial condition and is placed online.
32	–	$\overline{\text{Fault}}$	Output	This signal is low when the printer is offline, paper is out, or when there is a printer error.
33	–	Signal Ground	–	Logic ground level (0 V)
34	–	–	–	No connection
35	–	+5 VR	Output	Pulled up to +5 V through a 3.3 kΩ resistor
36	–	$\overline{\text{SLCT-IN}}$	Input	Not used

Nibble Mode

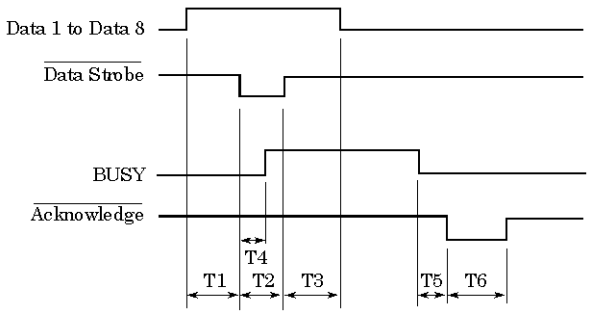
Pin numbers 2 to 9, 15 to 31, and 33 to 35 are the same as the conventional mode.

Pin No.	Return Pin No.	Signal Name	Direction	Description
1	19	Host Clock	Input	This signal is set high when the host requests the reverse data transfer phase (nibble mode).
10	28	Printer Clock	Output	Reverse data transfer phase: This signal goes high when data being sent to the host is established. Reverse idle phase: This signal is set low then goes high to interrupt the host, indicating that data is available.
11	29	Printer Busy	Output	Reverse data transfer phase: Data bit 3, data bit 7, then forward path (host to printer) busy status
12	30	Ack Data Req	Output	Reverse data transfer phase: Data bit 2, then data bit 6 Reverse idle phase: This signal is set high until the host requests data and, after that, follows the $\overline{\text{Data Available}}$ signal.
13	–	X Flag	Output	Reverse data transfer phase: Data bit 1, then data bit 5

Pin No.	Return Pin No.	Signal Name	Direction	Description
14	–	Host Busy	Input	Reverse data transfer phase: This signal is set low when the host can receive data, and goes high when the host has received data. Following a reverse data transfer, the interface enters the reverse idle phase when the Host Busy signal goes low and the printer has no data. Reverse idle phase: This signal goes high when the Printer Clock signal goes low so that the interface re-enters the reverse data transfer phase. If it goes high with the 1284 Active signal low, the 1284 idle phase is aborted and the interface returns to the compatibility mode.
32	–	$\overline{\text{Data Available}}$	Output	Reverse data transfer phase: This signal is set low when the printer is ready to send data to the host. During the data transfer, it is used as data bit 0 (LSB), then data bit 4. Reverse idle phase: This signal is used to indicate that data is available.
36	–	1284 Active	Input	This signal goes high to cause the printer to enter the reverse data transfer phase (nibble mode).

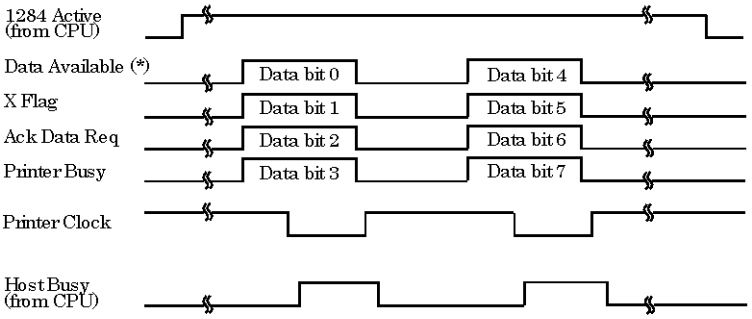
Data Transmission Timing

In unidirectional mode (conventional Centronics interface), this printer guarantees the received data when the Data and Data Strobe signals from the computer have the following timing with respect to the Busy and Acknowledge signals from the printer.



T1, T2, T3 > 1 µs
T4 < 1 µs
0 µs < T5 < 3 µs
2 µs < T6 < 6 µs

In bidirectional mode (nibblemode), this printer can send data to the computer. Data is sent in units of four bits (nibble) using four output signal lines as data paths. The following outlines one byte of data sent during reverse data transfer phase in nibble mode.



* Data Available is assigned for the cable.

SERIAL INTERFACE

RS-232C is the standard serial interface for data terminal equipment. The cable connector at the printer side should be a D-subminiature Cannon or Cinch DB-25P male connector or equivalent that conforms to EIA standards.

The table that follows shows the pin assignments commonly used by most computers. In the table:

- "Input" denotes a signal from the computer to the printer.
- "Output" denotes a signal from the printer to the computer.
- The signal level for mark state (logical 1) is -3 V or lower; for space state (logical 0), it is +3 V or higher.

Pin No.	Signal Name	Direction	Description
1	FG	–	Frame Ground
2	TD	Output	This pin carries information from the printer to the computer.
3	RD	Input	Received Data. This pin carries information from the computer to the printer.
4	RTS	Output	Request To Send. Spaces are sent when the printer is ready to transmit data.
5	CTS	Input	Clear To Send. Spaces are sent when the computer is ready to receive data.
6	DSR	Input	Data Set Ready. Spaces are sent when the computer has been powered on and is ready to receive or transmit data.
7	SG	–	Signal Ground (common return)
8	CD	Input	Carrier Detect. Spaces are sent when the computer allows the printer to receive data.
11	RC	Output	Reverse Channel. This signal is used instead of the DTR signal in the RC protocol. Spaces are sent when the printer is ready to receive or transmit data.
20	DTR	Output	Data Terminal Ready. Spaces are sent when the printer has been powered on and is ready to receive or transmit data.

Serial Options

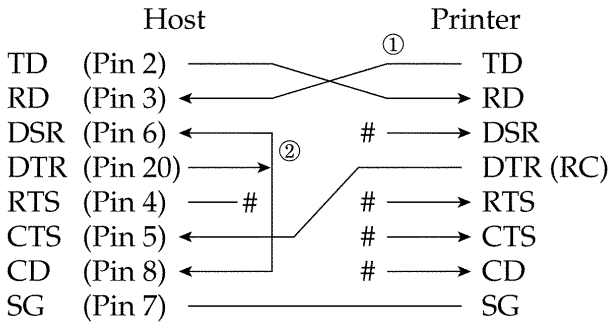
The serial options for the computer and the printer must match. Use the printer control panel, the computer operating system, or your software to change options specified as "selectable."

Transmission mode:	Asynchronous, full duplex, or half duplex (selectable)
Speed:	150, 300, 600, 1200, 2400, 4800, 9600, or 19200 baud (selectable)
Data bits:	7 or 8 bits (selectable)
Parity bit:	Odd, even, mark, space, or none (selectable)
Start bit:	1 bit
Stop bit:	1 or 2 bits (selectable)
Protocol:	XON/XOFF (DC1/DC3), DTR (Data Terminal Ready), or RC (Reverse Channel) (selectable)
Buffer size:	256, 2K, 8K, 24K, 32K, 96K, or 128K bytes (selectable)

Cable Wiring

This printer allows two types of serial communication control: DSR-enabled and DSR-disabled. The type of control required is determined by your computer requirements. The type of control also affects the way the interface cable is wired. To determine whether you need DSR-enabled control or DSR-disabled control, use the printer HARDWRE function (see Chapter 5).

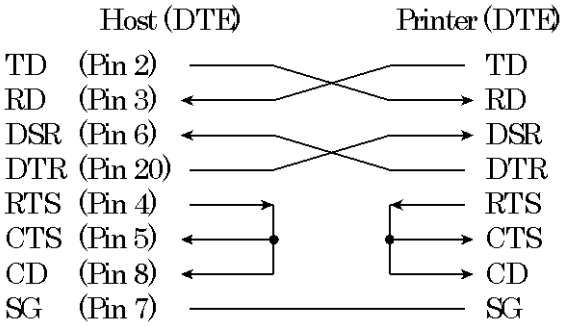
DSR-disabled control offers simpler cabling and communication than does DSR-enabled control. DSR-disabled control can be used to interface with an IBM PC and most other personal computers. With DSR-disabled control, the input control signals DSR, CTS, and CD are always considered high, regardless of their actual states. Therefore, no wire connection for these pins is required. The following figure shows the wiring required for connection to an IBM PC.



# indicates an open wire.
Wire q is unnecessary for the DTR (or RC) protocol.
Some computers may not require wire w.

DSR-enabled control enables communication using an RS-232C interface. The CTS and DSR input control signals are enabled; CD is ignored. DSR must be high when the printer receives data. If the printer has data to be transmitted to the computer, the printer transmits the data when both DSR and CTS are high.

When using DSR-enabled control, use a straight-through cable to connect to a DCE (data communications equipment) device. Use a null-modem cable to connect to a DTE (data terminal equipment) device, as shown below.



Serial Protocols

A protocol is a set of instructions that control the way data is transmitted between devices such as a computer and printer. The protocol ensures that the computer does not send information to the printer faster than the information can be processed. By telling the computer when the printer can receive data, the protocol prevents the printer s buffer from overflowing.

This printer offers a choice of four different protocols for connection to a variety of computers: XON/XOFF, DTR, and RC. If you computer documentation does not recommend a particular protocol, try DTR. The following table describes the three protocols.

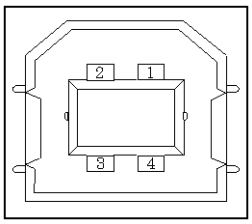
Protocol	Description
XON/XOFF (DC1/DC3)	When the printer is ready to receive data, it sends the XON (DC1) code (hex 11). When fewer than 255 bytes of space remain in the buffer (or when the printer is taken offline), the printer sends the XOFF (DC3) code (hex 13). (When the input buffer is configured for 256 bytes, the buffer limit is reduced from 255 bytes to 63 bytes.) The computer must stop transmitting data within 255 (63) characters of receiving the XOFF code, or information may be lost. If paper runs out, the printer sends an NAK code (hex 15).
DTR	DTR is a hardware protocol; that is, the DTR signal on interface cable pin 20 is used to control the flow of data rather than transmission of a character code. When the printer is ready to receive data, pin 20 is high. When fewer than 255 (63) bytes of space remain in the buffer (or when the printer is taken offline), pin 20 is low. The computer must stop transmitting data within 255 (63) characters of DTR being low, or information may be lost.
RC	The RC protocol is the same as the DTR protocol, except that the Reverse Channel signal (pin 11) is used instead of the Data Terminal Ready signal (pin 20).

USB INTERFACE

Cable

This printer supports the USB 1.1 Full speed specification. To connect to the host, use USB 2.0-compliant INF cables (5 meters (196 inch) or shorter). (Use the shielded cables.)

Connector pin alignment



No.	Signal line name	Function
1	vbus	Power supply
2	D-	Data transfer
3	D+	Data transfer
4	GND	Signal ground
Shell	Shield	

- Connector specification

Printer side	Type B receptacle (female) Upstream port
Cable side	Type B plug (male)

Specification

- Basic specification — USB interface compliant

  Note

  It does not guarantee all operations on hosts.

- Power control — Self-power device

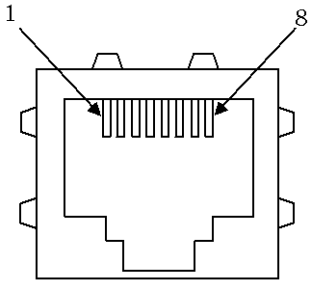
- Transmission mode — Full speed (Maximum 12 Mbps +0.25%)

LAN INTERFACE

Cable

This printer supports the 10Base-T and 100Base-TX cables.

Connector pin alignment



No.	Signal line name	DIR	Function
1	TXO+	NIC-HUB	Transmit data +
2	TXO-	NIC-HUB	Transmit data -
3	RXI+	HUB-NIC	Receive data +
4	–	–	–
5	–	–	–
6	RXI-	HUB-NIC	Receive data -
7	–	–	–
8	–	–	–

E

CHARACTER SETS

CHARACTER SETS 1 AND 2 (DPL24C PLUS AND IBM XL24E EMULATION)

Below are character sets 1 and 2 of Code Page 437, available in the DPL24C PLUS command set and the IBM Proprinter XL24E emulation. Characters enclosed in boxes differ for sets 1 and 2. Characters in set 2 also vary with the national character set.

Code Page 437 is for the USA character set.

Code Page 437 Character Set 1

LNH	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0	NUL	DLE	SP	0	@	P	`	p	NUL	DLE	á	▒	└	╨	α	≡
1	SOH	DC1	!	1	A	Q	a	q	SOH	DC1	í	▒	┴	╤	ß	±
2	STX	DC2	"	2	B	R	b	r	STX	DC2	ó	▒	┬	╥	Γ	≥
3	ETX	DC3	#	3	C	S	c	s	ETX	DC3	ú	▒	├	╙	π	≤
4	EOT	DC4	$	4	D	T	d	t	EOT	DC4	ñ	▒	─	╘	Σ	⌠
5	ENQ	NAK	%	5	E	U	e	u	ENQ	NAK	Ñ	▒	┼	╒	σ	⌡
6	ACK	SYN	&	6	F	V	f	v	ACK	SYN	ª	▒	╞	╓	µ	÷
7	BEL	ETB	'	7	G	W	g	w	BEL	ETB	º	▒	╟	╫	τ	≈
8	BS	CAN	(	8	H	X	h	x	BS	CAN	¿	▒	╚	╪	Φ	°
9	HT	EM	)	9	I	Y	i	y	HT	EM	⌐	▒	╔	┘	Θ	∙
A	LF	SUB	*	:	J	Z	j	z	LF	SUB	¬	▒	╩	┌	Ω	·
B	VT	ESC	+	;	K	[	k	{	VT	ESC	½	▒	╦	▌	δ	√
C	FF	FS	,	<	L	\	l	|	FF	FS	¼	▒	╠	▄	∞	ⁿ
D	CR	GS	-	=	M	]	m	}	CR	GS	¡	▒	═	▐	ø	²
E	SO	RS	.	>	N	^	n	~	SO	RS	«	▒	╬	▀	ε	■
F	SI	US	/	?	O	_	o	DEL	SI	US	»	▒	╧	α	∩	SP

Code Page 437 Character Set 2

LNH	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0	NUL	DLE	SP	0	@	P	`	p	Ç	É	á	▒	└	╨	α	≡
1	SOH	DC1	!	1	A	Q	a	q	ü	æ	í	▒	┴	╤	ß	±
2	STX	DC2	"	2	B	R	b	r	é	Æ	ó	▒	┬	╥	Γ	≥
3	♥	DC3	#	3	C	S	c	s	â	ô	ú	▒	├	╙	π	≤
4	♦	DC4	$	4	D	T	d	t	ä	ö	ñ	▒	─	╘	Σ	⌠
5	♣	§	%	5	E	U	e	u	à	ò	Ñ	▒	┼	╒	σ	⌡
6	♠	SYN	&	6	F	V	f	v	å	û	ª	▒	╞	╓	µ	÷
7	BEL	ETB	'	7	G	W	g	w	ç	ù	º	▒	╟	╫	τ	≈
8	BS	CAN	(	8	H	X	h	x	ê	ÿ	¿	▒	╚	╪	Φ	°
9	HT	EM	)	9	I	Y	i	y	ë	Ö	⌐	▒	╔	┘	Θ	∙
A	LF	SUB	*	:	J	Z	j	z	è	Ü	¬	▒	╩	┌	Ω	·
B	VT	ESC	+	;	K	[	k	{	ï	¢	½	▒	╦	▌	δ	√
C	FF	FS	,	<	L	\	l	|	î	£	¼	▒	╠	▄	∞	ⁿ
D	CR	GS	-	=	M	]	m	}	ì	¥	¡	▒	═	▐	ø	²
E	SO	RS	.	>	N	^	n	~	Ä	₧	«	▒	╬	▀	ε	■
F	SI	US	/	?	O	_	o	DEL	Å	ƒ	»	▒	╧	α	∩	SP

ITALIC AND GRAPHICS CHARACTER SETS (ESC/P2 EMULATION)

The following shows character sets available in the Epson ESC/P2 emulation. Characters differ in codes 128 to 255 (hex 80 to FF).

Italic Character Set

L/H	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0	NUL	DLE	SP	0	@	P	`	p	NUL	DLE	SP	*0*	*@*	*P*	*`*	*p*
1	SOH	DC1	!	1	A	Q	a	q	SOH	DC1	*!*	*1*	*A*	*Q*	*a*	*q*
2	STX	DC2	"	2	B	R	b	r	STX	DC2	*"*	*2*	*B*	*R*	*b*	*r*
3	ETX	DC3	#	3	C	S	c	s	ETX	DC3	*#*	*3*	*C*	*S*	*c*	*s*
4	EOT	DC4	$	4	D	T	d	t	EOT	DC4	*$*	*4*	*D*	*T*	*d*	*t*
5	ENQ	NAK	%	5	E	U	e	u	ENQ	NAK	*%*	*5*	*E*	*U*	*e*	*u*
6	ACK	SYN	&	6	F	V	f	v	ACK	SYN	*&*	*6*	*F*	*V*	*f*	*v*
7	BEL	ETB	'	7	G	W	g	w	BEL	ETB	*'*	*7*	*G*	*W*	*g*	*w*
8	BS	CAN	(	8	H	X	h	x	BS	CAN	*(*	*8*	*H*	*X*	*h*	*x*
9	HT	EM	)	9	I	Y	i	y	HT	EM	*)*	*9*	*I*	*Y*	*i*	*y*
A	LF	SUB	*	:	J	Z	j	z	LF	SUB	*	*:*	*J*	*Z*	*j*	*z*
B	VT	ESC	+	;	K	[	k	{	VT	ESC	*+*	*;*	*K*	*[*	*k*	*{*
C	FF	FS	,	<	L	\	l	|	FF	FS	,	<	*L*	\	*l*	*|*
D	CR	GS	-	=	M	]	m	}	CR	GS	-	=	*M*	*]*	*m*	*}*
E	SO	RS	.	>	N	^	n	~	SO	RS	.	>	*N*	^	*n*	~
F	SI	US	/	?	O	_	o	DEL	SI	US	*/*	*?*	*O*	_	*o*	SP

Graphics Character Set 1

L/H	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0	NUL	DLE	SP	0	@	P	`	p	NUL	DLE	á	▒	└	╨	α	≡
1	SOH	DC1	!	1	A	Q	a	q	SOH	DC1	í	▒	┴	╤	ß	±
2	STX	DC2	"	2	B	R	b	r	STX	DC2	ó	▒	┬	╙	Γ	≥
3	ETX	DC3	#	3	C	S	c	s	ETX	DC3	ú	▒	├	╘	π	≤
4	EOT	DC4	$	4	D	T	d	t	EOT	DC4	ñ	▒	─	╒	Σ	⌠
5	ENQ	$	%	5	E	U	e	u	ENQ	NAK	Ñ	▒	┼	╓	σ	⌡
6	ACK	SYN	&	6	F	V	f	v	ACK	SYN	ª	▒	╞	╫	µ	÷
7	BEL	ETB	'	7	G	W	g	w	BEL	ETB	º	▒	╟	╪	τ	≈
8	BS	CAN	(	8	H	X	h	x	BS	CAN	¿	▒	╚	┘	Φ	°
9	HT	EM	)	9	I	Y	i	y	HT	EM	⌐	▒	╔	┌	Θ	∙
A	LF	SUB	*	:	J	Z	j	z	LF	SUB	¬	▒	╩	█	Ω	·
B	VT	ESC	+	;	K	[	k	{	VT	ESC	½	▒	╦	▌	δ	√
C	FF	FS	,	<	L	\	l	|	FF	FS	¼	▒	╠	▐	∞	ⁿ
D	CR	GS	-	=	M	]	m	}	CR	GS	¡	▒	═	▀	ø	²
E	SO	RS	.	>	N	^	n	~	SO	RS	«	▒	╬	▄	ε	■
F	SI	US	/	?	O	_	o	DEL	SI	US	»	▒	╧	▄	∩	SP

Graphics Character Set 2

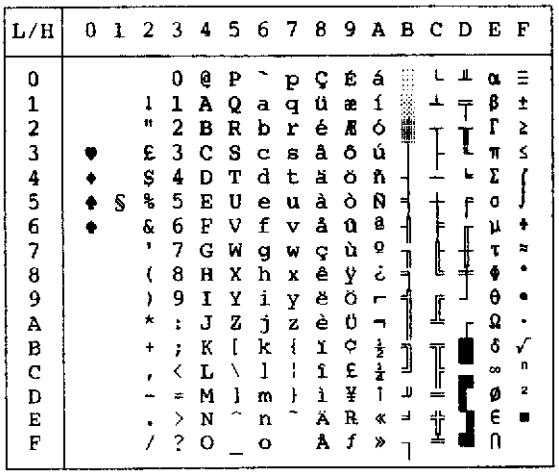
L/H	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0	NUL	DLE	SP	0	@	P	`	p	Ç	É	á	▒	└	╨	α	≡
1	SOH	DC1	!	1	A	Q	a	q	ü	æ	í	▒	┴	╤	ß	±
2	STX	DC2	"	2	B	R	b	r	é	Æ	ó	▒	┬	╙	Γ	≥
3	ETX	DC3	#	3	C	S	c	s	â	ô	ú	▒	├	╘	π	≤
4	EOT	DC4	$	4	D	T	d	t	ä	ö	ñ	▒	─	╒	Σ	⌠
5	ENQ	§	%	5	E	U	e	u	à	ò	Ñ	▒	┼	╓	σ	⌡
6	ACK	SYN	&	6	F	V	f	v	å	û	ª	▒	╞	╫	µ	÷
7	BEL	ETB	'	7	G	W	g	w	ç	ù	º	▒	╟	╪	τ	≈
8	BS	CAN	(	8	H	X	h	x	ê	ÿ	¿	▒	╚	┘	Φ	°
9	HT	EM	)	9	I	Y	i	y	ë	Ö	⌐	▒	╔	┌	Θ	∙
A	LF	SUB	*	:	J	Z	j	z	è	Ü	¬	▒	╩	▌	Ω	·
B	VT	ESC	+	;	K	[	k	{	ï	¢	½	▒	╦	▐	δ	√
C	FF	FS	,	<	L	\	l	|	î	£	¼	▒	═	▀	∞	ⁿ
D	CR	GS	-	=	M	]	m	}	ì	¥	¡	▒	╬	▄	ø	²
E	SO	RS	.	>	N	^	n	~	Ä	₧	«	▒	╧	▄	ε	■
F	SI	US	/	?	O	_	o	DEL	Å	ƒ	»	▒	╪	▄	∩	SP

NATIONAL CHARACTER SETS (ALL EMULATIONS)

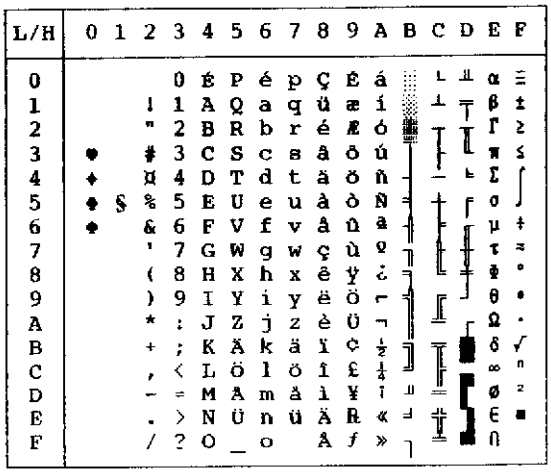
Below are the 52 national character sets available for all emulations of this printer. These character sets support different characters and symbols specific to different languages. Note that these tables are for Courier 10, a resident font, and that some national character sets do not have some characters and symbols whose use depends on resident fonts. For details, see the table at the end of this appendix.

When the following character sets are used with the Epson ESC/P2 emulation, the printing of FFh code characters is not supported.
ECMA94, ISO8859, ISO-LTN, ISO-TUK, CYRILIC, LATIN-9

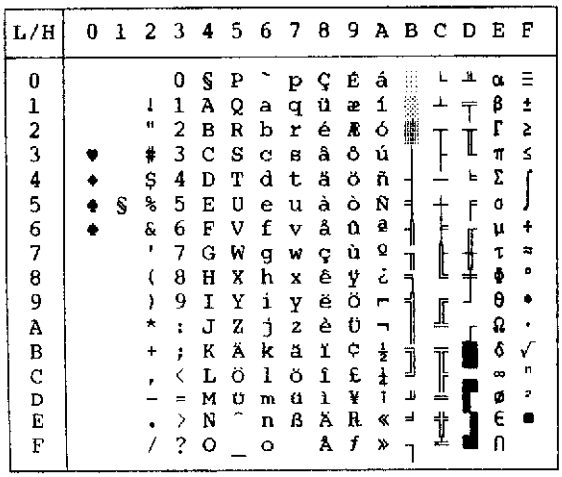
UK (British English)



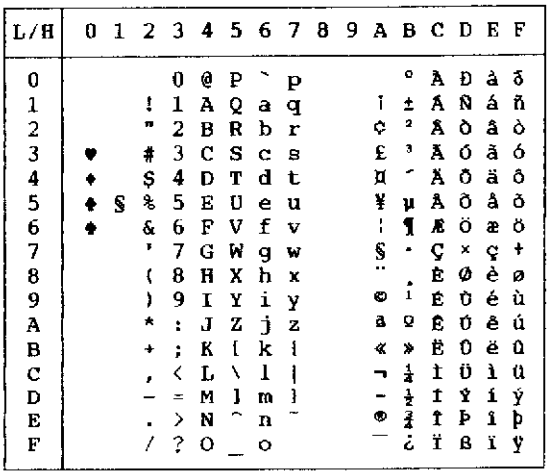
SWEDISH (Swedish)



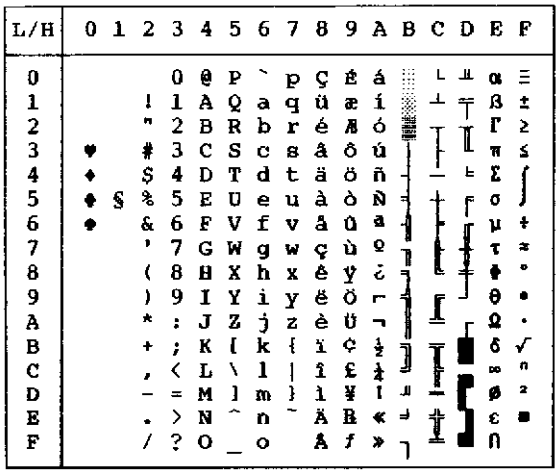
GERMAN (German)



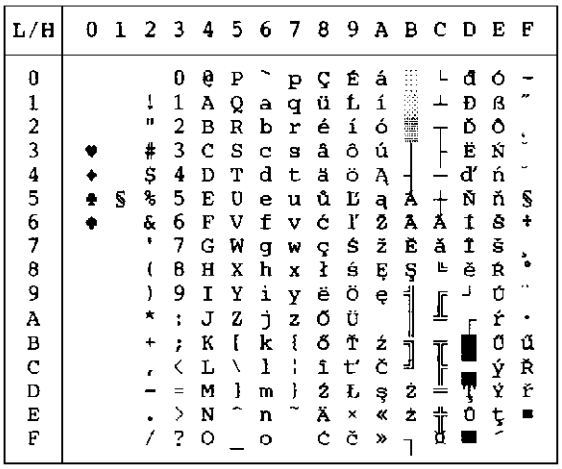
ISO8859/ECMA94 (ISO 8859-1/ECMA94)



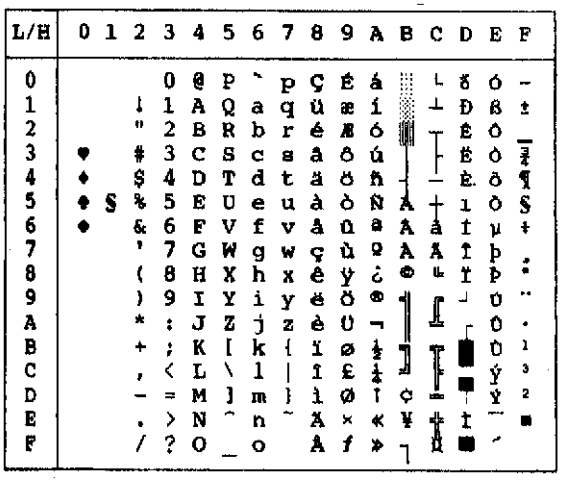
PAGE437/USA (Code Page 437/USA)



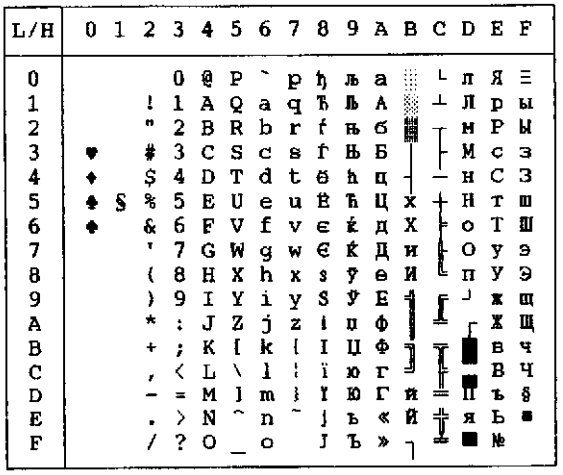
PAGE852/PG852-T (Code Page 852)



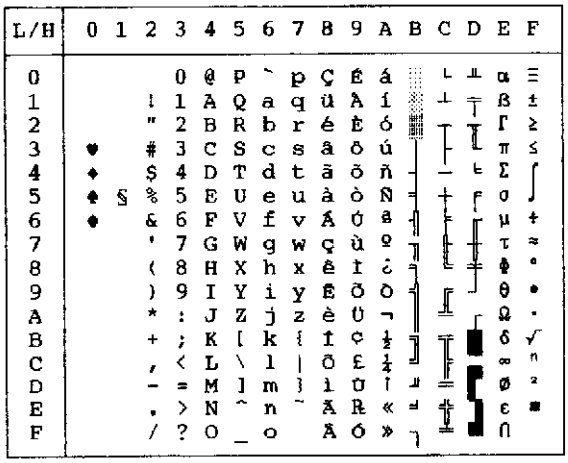
PAGE850 (Code Page 850(Multilingual))



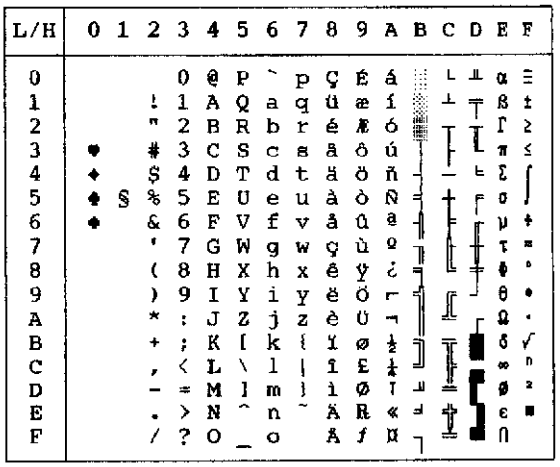
PAGE855 (Code Page 855)



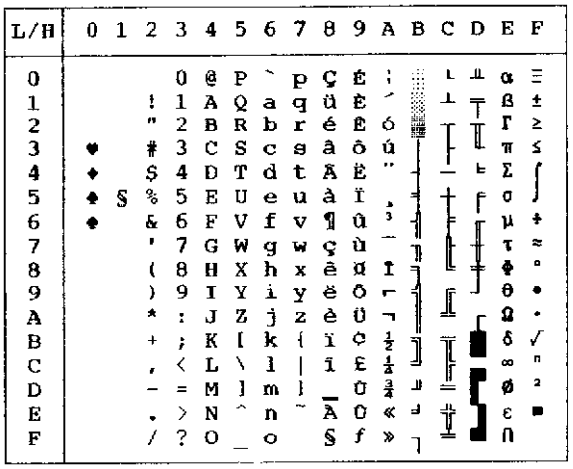
PAGE860 (Code Page 860(Portugal))



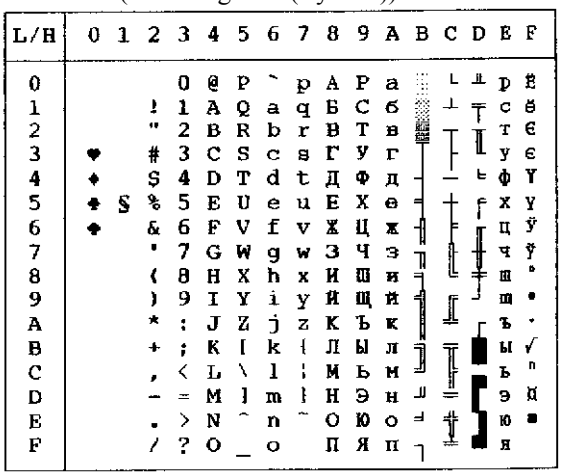
PAGE865 (Code Page 865(Nordic))



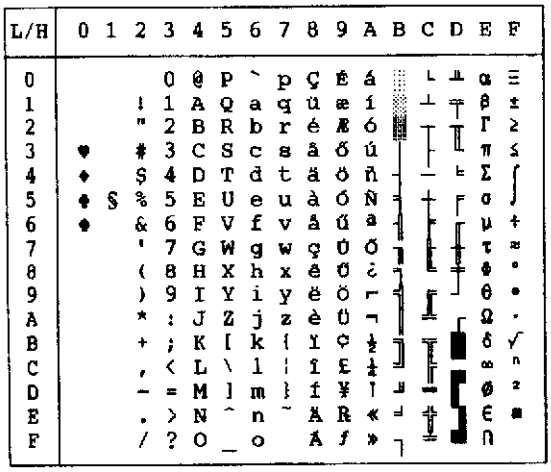
PAGE863 (Code Page 863(Canada-French))



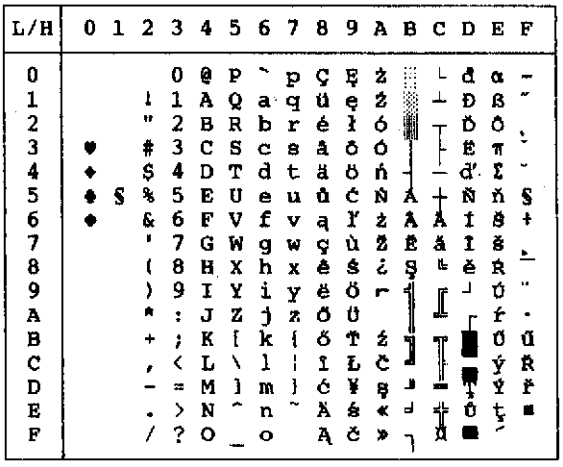
PAGE866 (Code Page 866(Cyrillic))



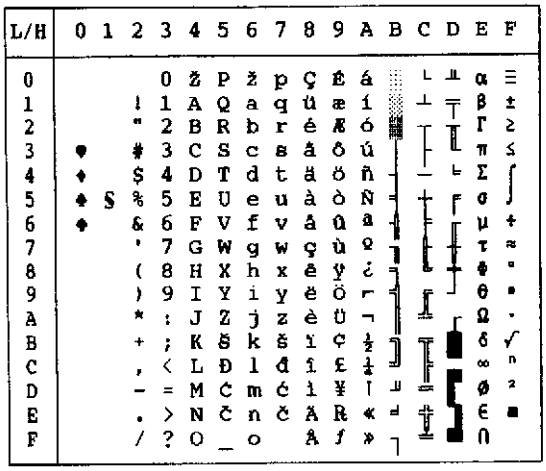
HUNGARY/HUNG-T (Hungarian)



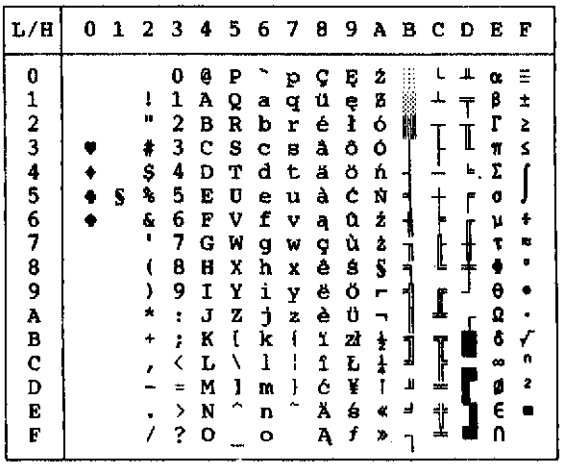
POLISH/POLSH-T (Polish)



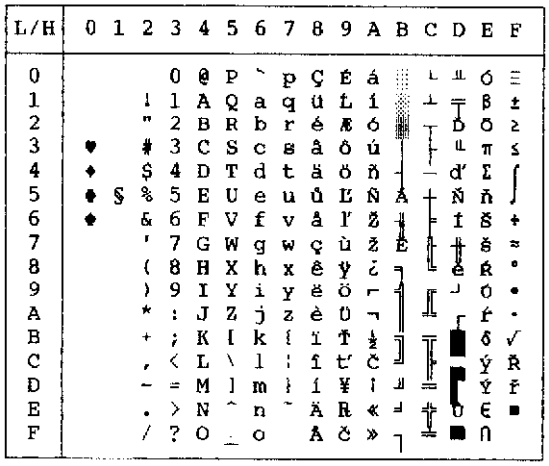
SLOV/SLOV-T (Slovenian)



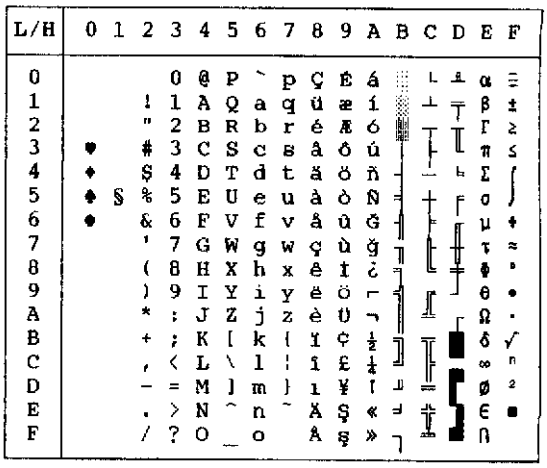
MAZOWIA/MAZOW-T (Mazowian)



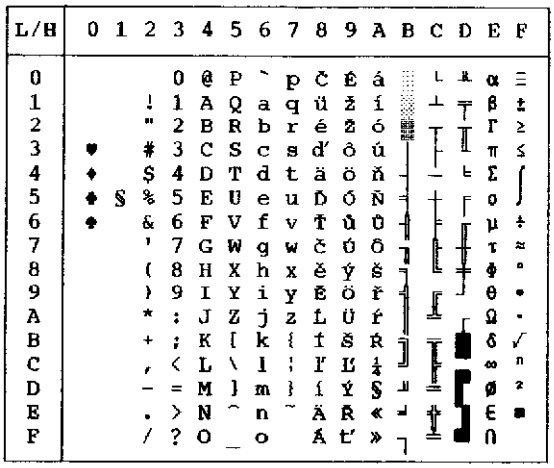
LATIN2/LATN2-T (Latin2)



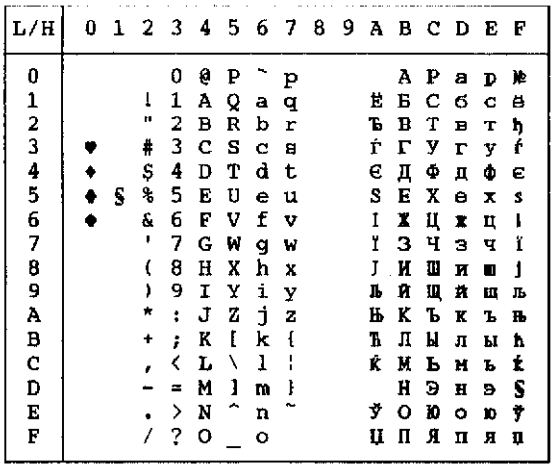
TURKY/TURKY-T (Turkish)



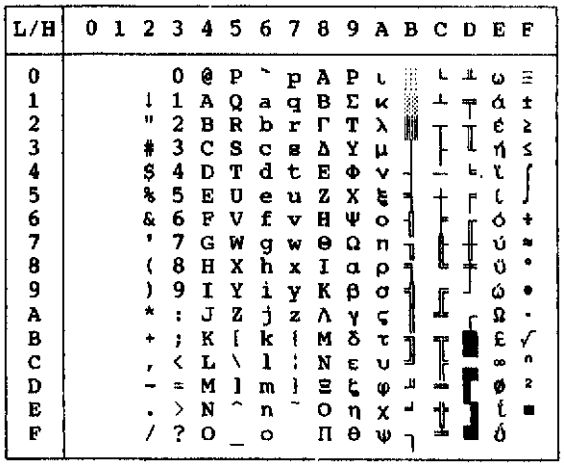
KAMENIC/KAMEN-T (Kamenicky)



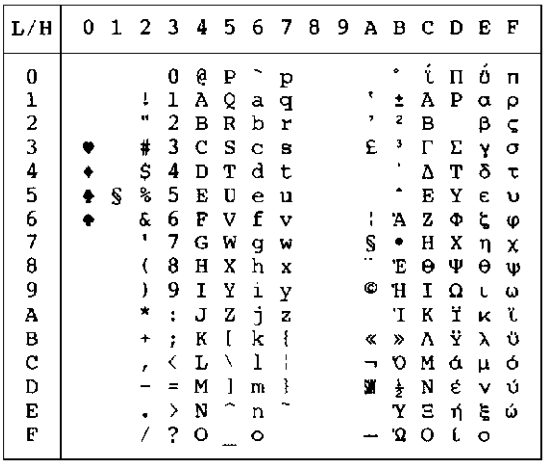
CYRILIC (Cyrillic)



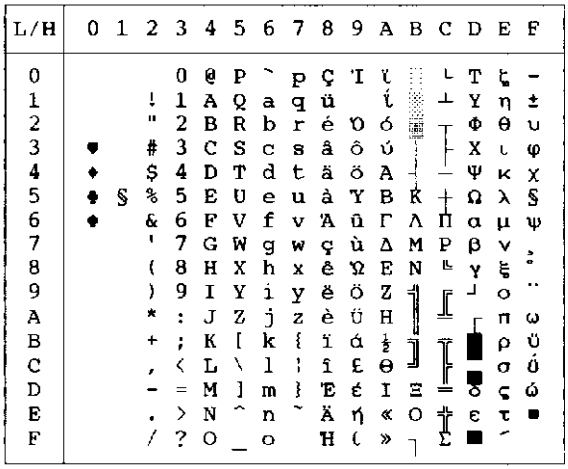
IBM437 (IBM 437)



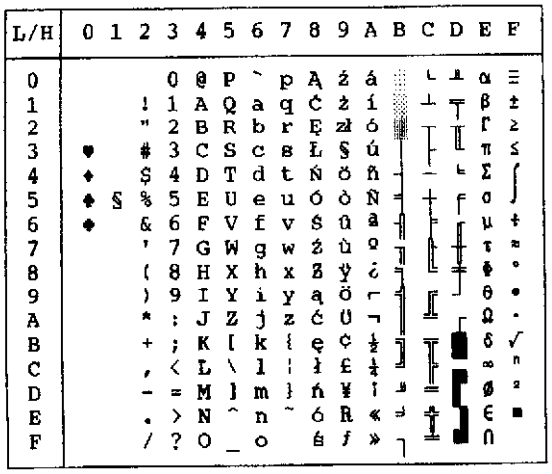
ELOT928 (ELOT 928)



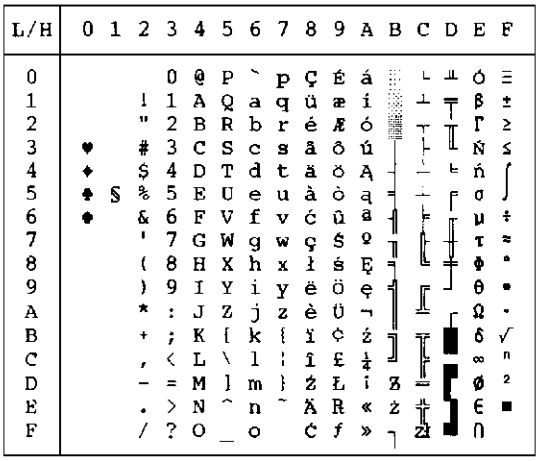
IBM851 (IBM 851)



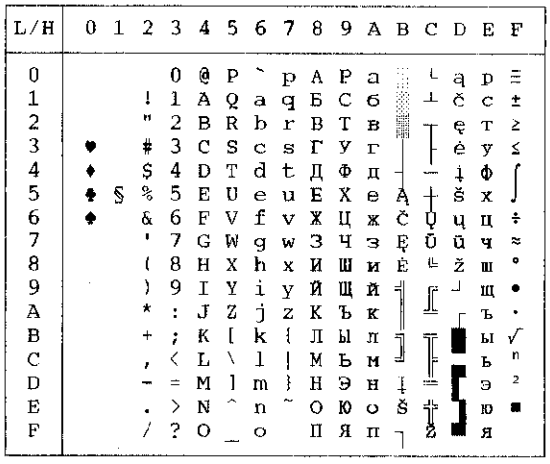
PG-DHN (Code Page DHN)



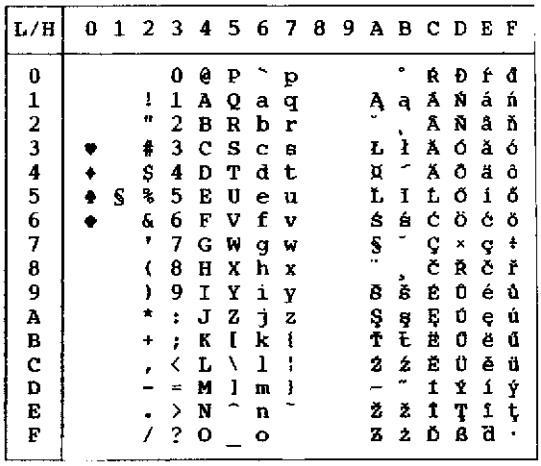
LATIN-P (Latin Polish)



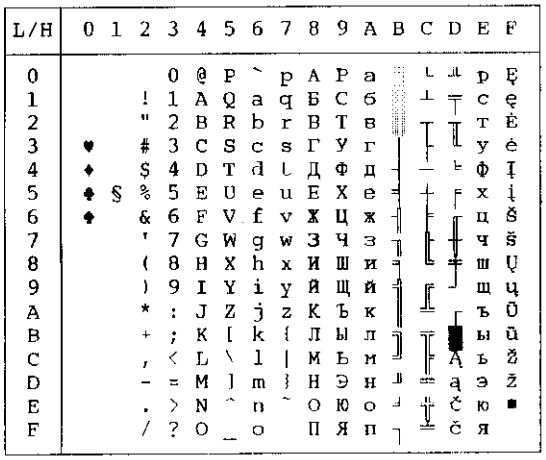
LITHUA1 (Lithuanian 1)



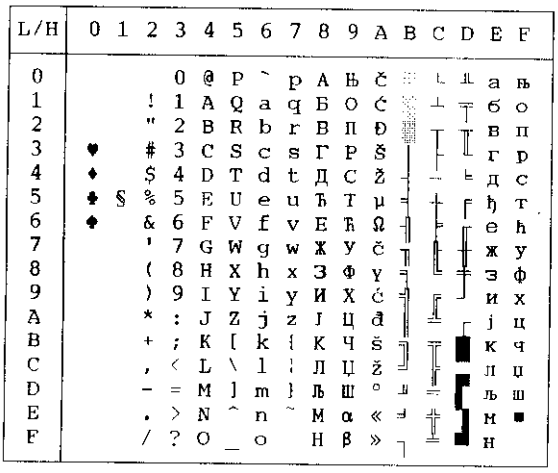
ISO-LTN (ISO Latin)



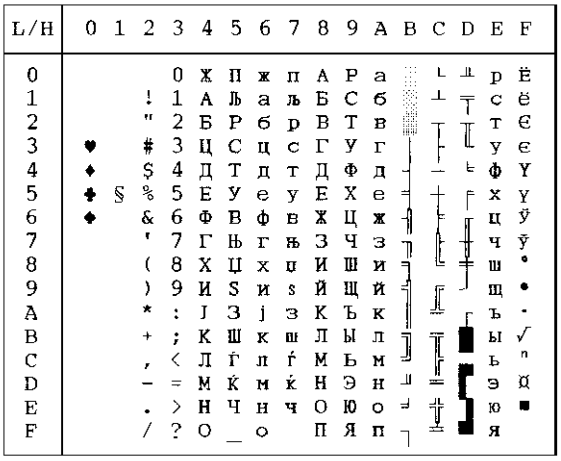
LITHUA2 (Lithuanian 2)



MACEDON (Macedonian)



PG-MAC



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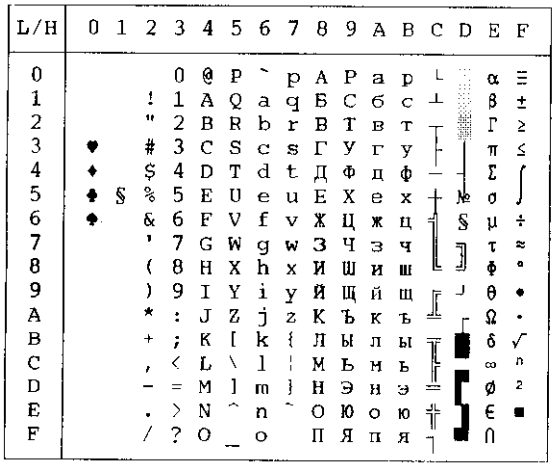
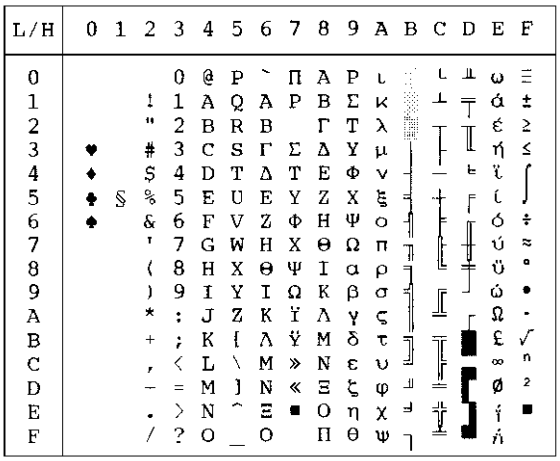
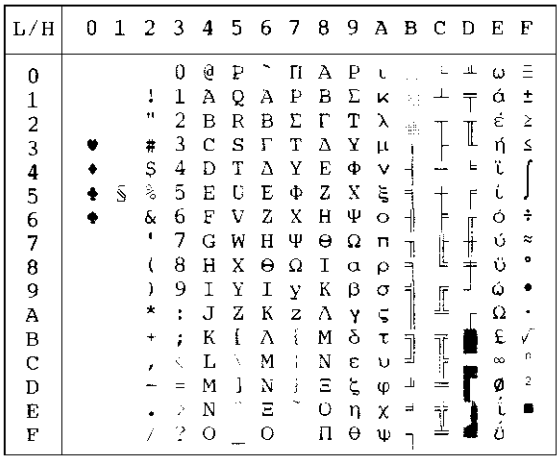


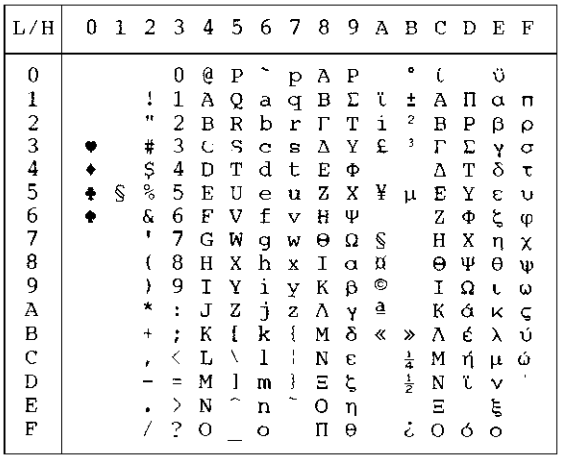
ELOT 927



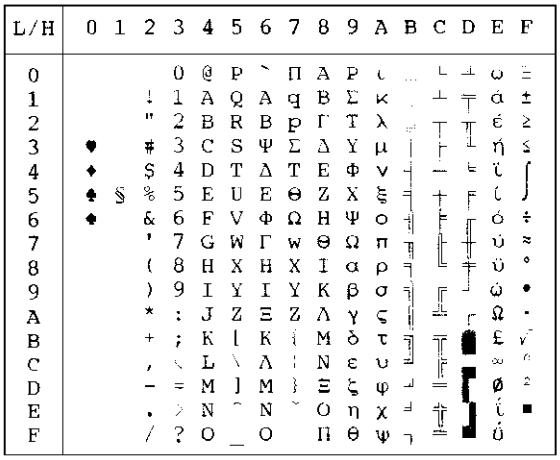
ABG



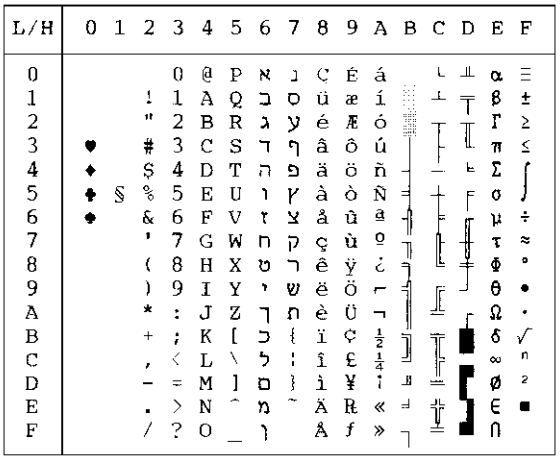
DEC GR



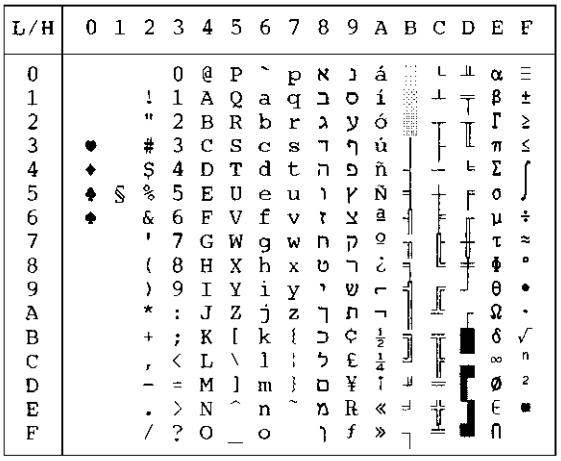
ABY



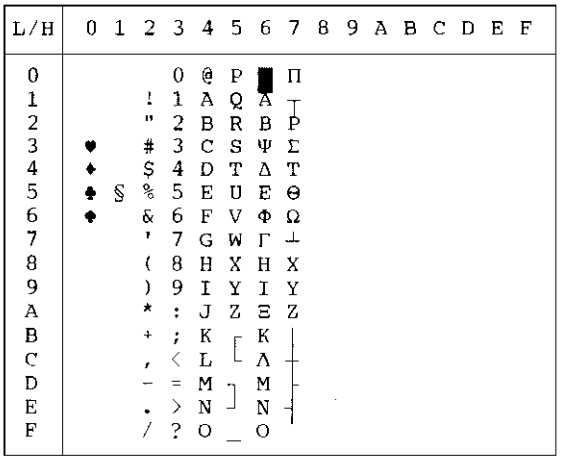
HBR-OLD



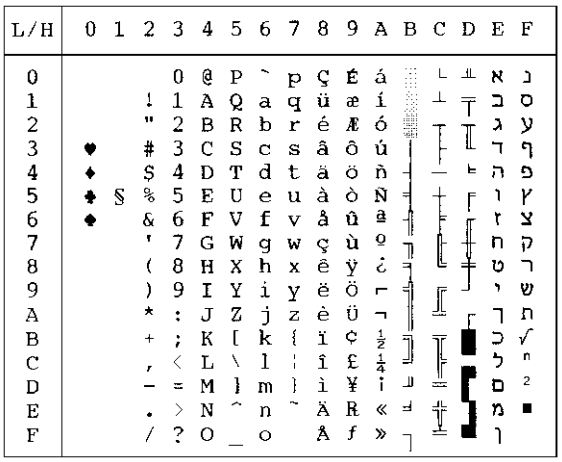
PAGE 862 (Code Page 862)



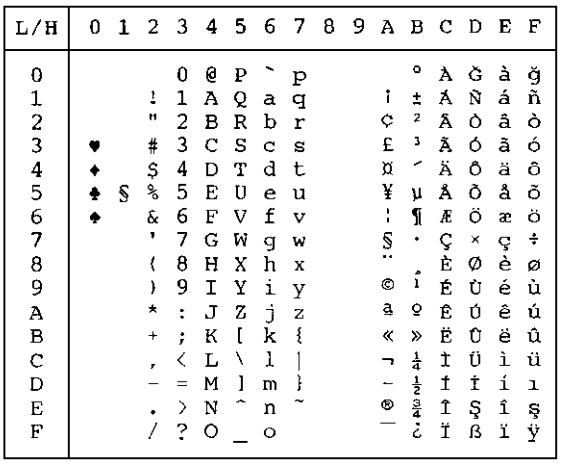
GREEK 11



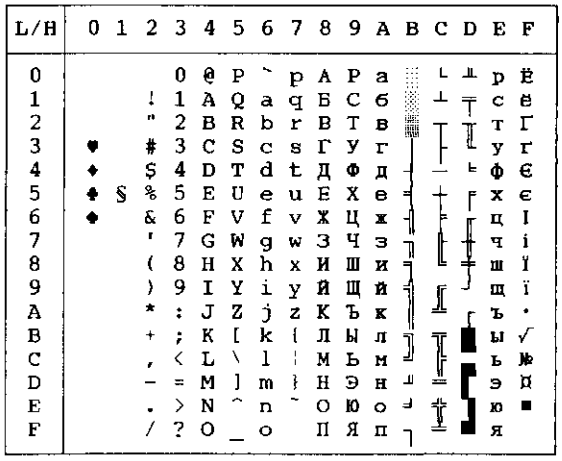
HBR-DEC



ISO-TUK



RUSCII



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LATIN-9

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WCP1250 (Windows – 1250)

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WCP1251 (Windows – 1251)

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WCP1252 (Windows – 1252)

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NATIONAL CHARACTER SETS (DPL24C PLUS AND IBM XL24E EMULATION)

The following character sets differ from those of Code Page 437 (USA), available in the DPL24C PLUS command set and the IBM Proprinter XL24E emulation.

FRENCH (French)

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C			,	<	L	ç	l	ù	î	£	¼	▓	╠	▄	∞	ⁿ
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ITALIAN (Italian)

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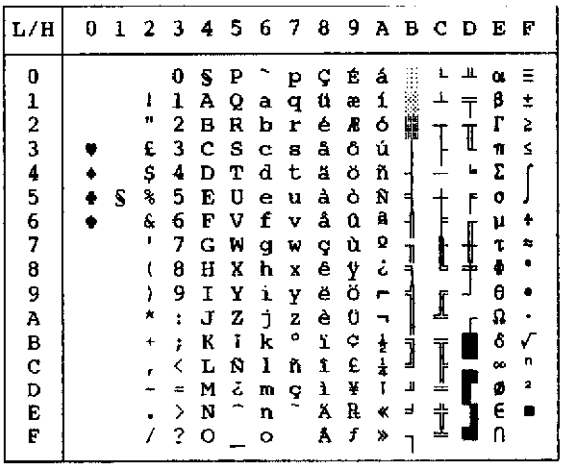
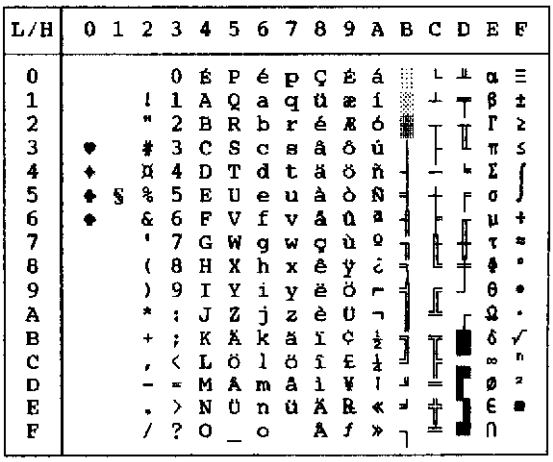
1			!	1	A	Q	a	q	ü	æ	í	▓	┴	╤	ß	±
2			"	2	B	R	b	r	é	Æ	ó	▓	┬	╥	Γ	≥
3	♥		£	3	C	S	c	s	â	ô	ú	▓	├	╙	π	≤
4	♦		$	4	D	T	d	t	ä	ö	ñ	▓	─	╘	Σ	⌠
5	♣	§	%	5	E	U	e	u	à	ò	Ñ	▓	┼	╒	σ	⌡
6	♠		&	6	F	V	f	v	å	û	ª	▓	╞	╓	µ	÷
7			'	7	G	W	g	w	ç	ù	º	▓	╟	╫	τ	≈
8			(	8	H	X	h	x	ê	ÿ	¿	▓	╚	╪	Φ	°
9			)	9	I	Y	i	y	ë	Ö	⌐	▓	╔	┘	Θ	∙
A			*	:	J	Z	j	z	è	Ü	¬	▓	╩	┌	Ω	·
B			+	;	K	°	k	à	ï	¢	½	▓	╦	█	δ	√
C			,	<	L	ç	l	ò	î	£	¼	▓	╠	▄	∞	ⁿ
D			-	=	M	é	m	è	ì	¥	¡	▓	═	▌	ø	²
E			.	>	N	^	n	ì	Ä	₧	«	▓	╬	▐	Є	■
F			/	?	O	_	o		Å	ƒ	»	▓	╧	▀	∩	

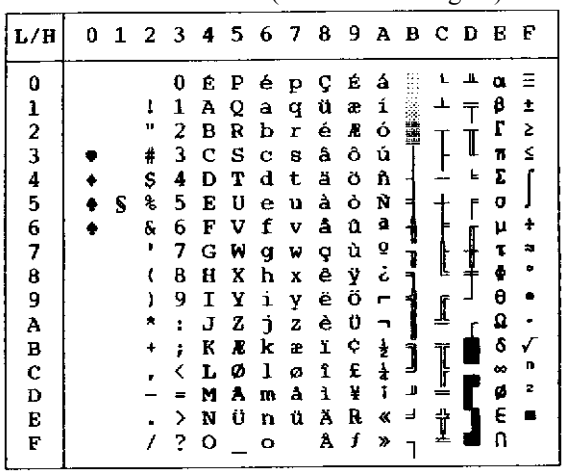
SPANISH (Spanish)



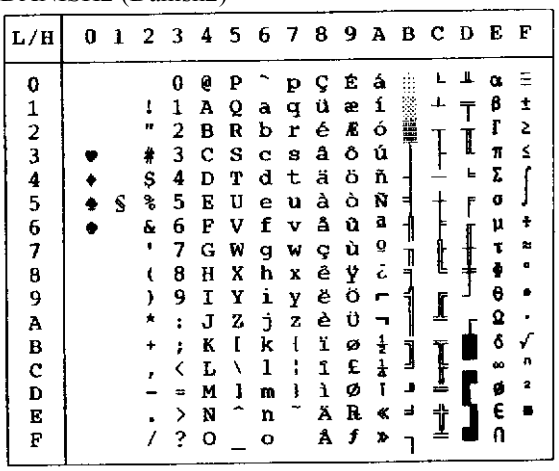
FINNISH (Finnish)



DANISH1/NORWEGN (Danish1/Norwegian)



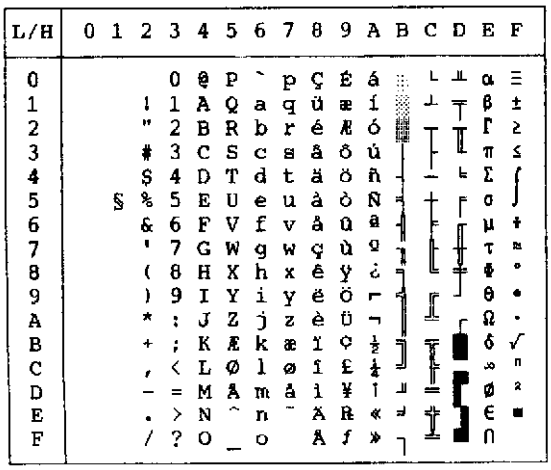
DANISH2 (Danish2)



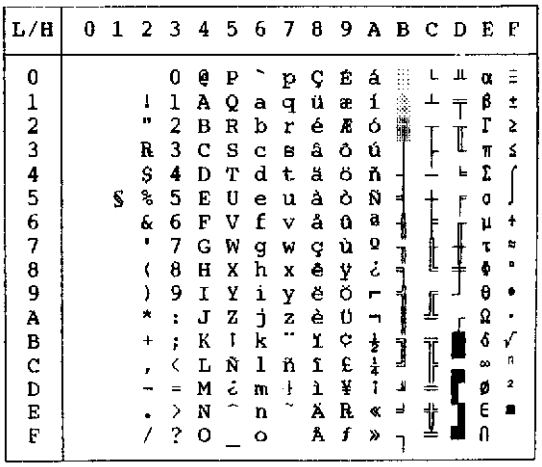
NATIONAL CHARACTER SETS (ESC/P2 EMULATION)

The following character sets differ from the graphics character sets available in the Epson ESC/P2 emulation.

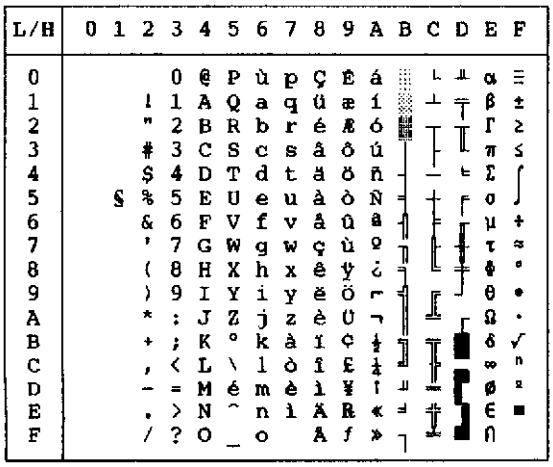
DANISH1 (Danish1)



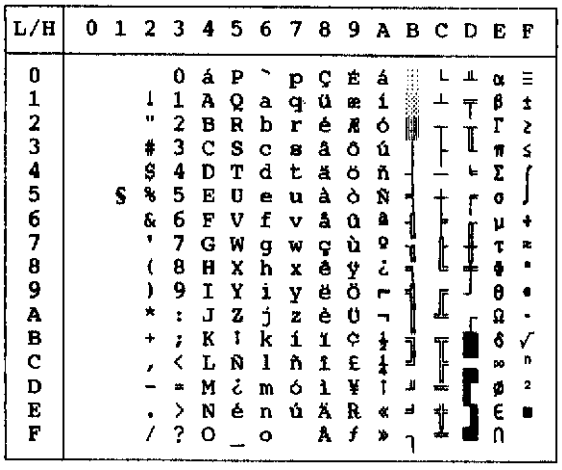
SPANSH1 (Spanish1)



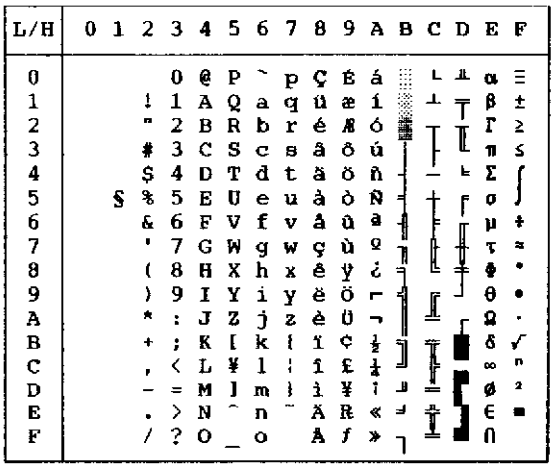
ITALIAN (Italian)



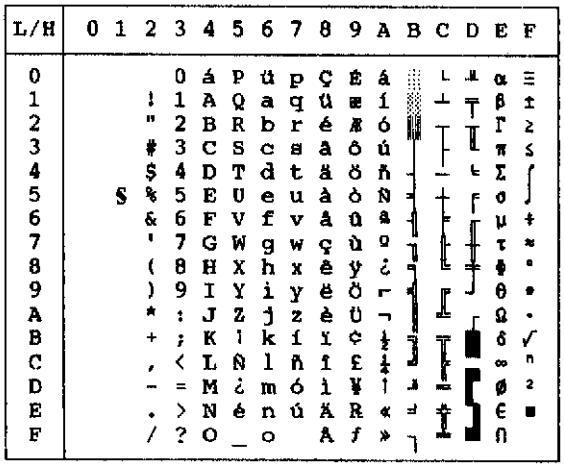
SPANSH2 (Spanish2)



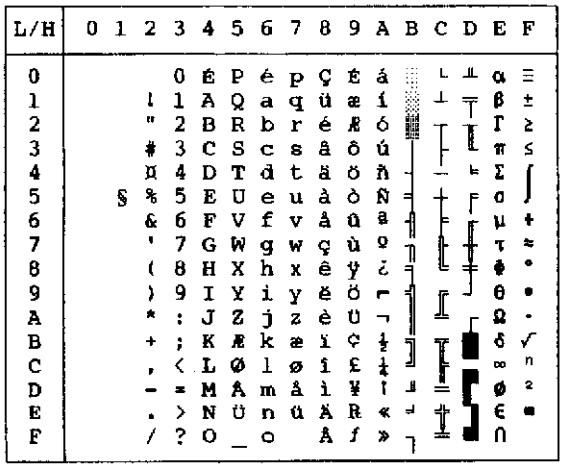
JAPAN (Japanese)



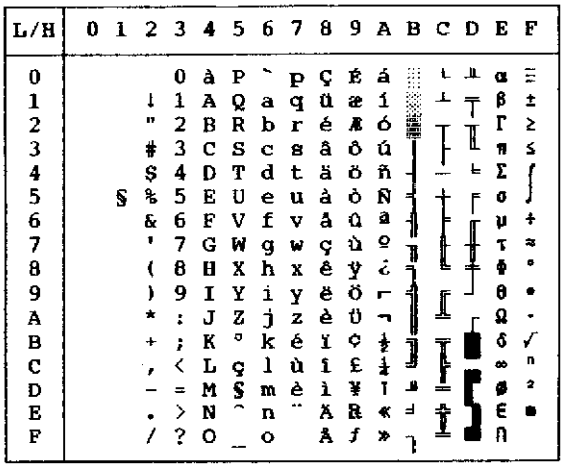
LATIN A (Latin American)



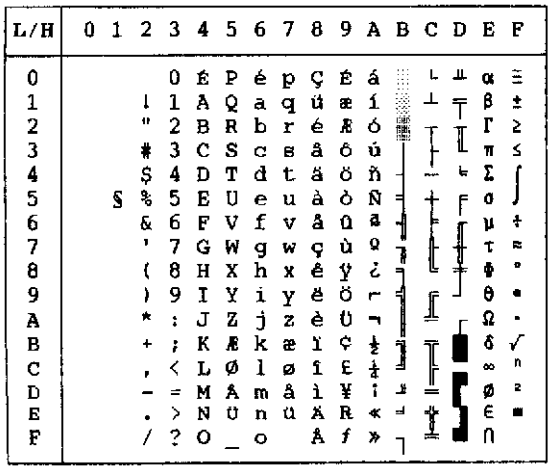
NORWEGN (Norwegian)



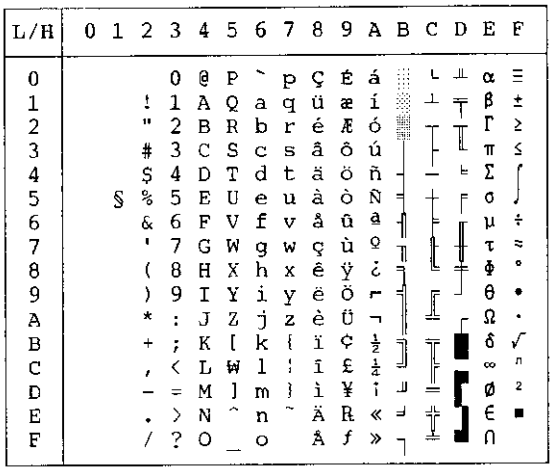
FRENCH (French)



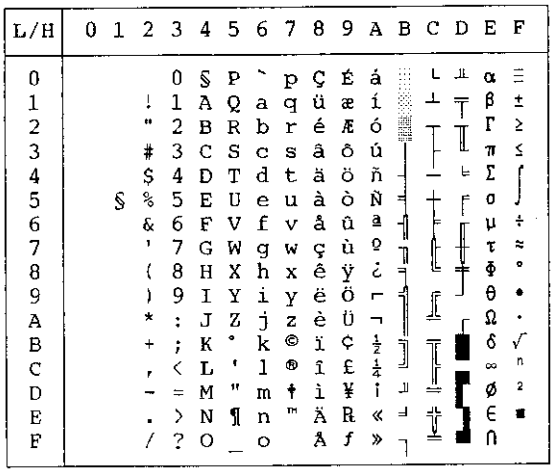
DANISH2 (Danish2)



KOREA



LEGAL



NATIONAL CHARACTER SETS AND SUPPORTED RESIDENT FONTS (ALL EMULATIONS)

In all emulations, this printer supports 52 national character sets for characters and symbols specific to different languages. Some national character sets, however, do not have some characters and symbols and may not be usable, depending on resident fonts. The following tables show which of the resident fonts are supported for each national character set:

Resident font		Courier 10	Elite 12	Compress	Draft	Bold PS	Pica 10	Courier scalable **	Timeless **	Nimbus Sans **	Correspondence	OCR-B	OCR-A
National character set	Name in setup menu												
USA *	USA	√	√	√	√	√	√	√	√	√	√	√	√
United Kingdom	UK	√	√	√	√	√	√	√	√	√	√	√	
German	GERMAN	√	√	√	√	√	√	√	√	√	√	√	
Swedish	SWEDISH	√	√	√	√	√	√	√	√	√	√	√	
ISO 8859-1	ISO8859	√	√	√	√	√	√	√	√	√	√	√	
ECMA94	ECMA94	√	√	√	√	√	√	√	√	√	√	√	
Code Page 437*	PAGE437	√	√	√	√	√	√	√	√	√	√	√	√
Code Page 850	PAGE850	√	√	√	√	√	√	√	√	√	√	√	
Code Page 852	PAGE852	√	√	√	√	√	√	√	√	√	√		
Code two-pass	PAGE852-T	√	√	√	√	√	√	√	√	√	√		
Code Page 855	PAGE855	√	√	√			√	√	√	√			
Code Page 860	PAGE860	√	√	√	√	√	√	√	√	√	√	√	
Code Page 863	PAGE863	√	√	√	√	√	√	√	√	√	√	√	
Code Page 865	PAGE865	√	√	√	√	√	√	√	√	√	√	√	
Code Page 866	PAGE866	√	√	√			√	√	√	√			

(Continued on the next page)

* USA is the same as Code Page 437.
** Upright, italic, and bold available
√ : Supported

Resident font		Courier 10	Elite 12	Compress	Draft	Bold PS	Pica 10	Courier scalable **	Timeless **	Nimbus Sans **	Correspondence	OCR-A	OCR-B
National character set	**Name in setup menu**												
Hungarian	HUNGARY	√	√	√	√	√	√	√	√	√	√		
Hungarian two-pass	HUNG-T	√	√	√	√	√	√	√	√	√	√		
Slovenian	SLOV	√	√	√	√	√	√	√	√	√	√	√	
Slovenian two-pass	SLOV-T	√	√	√	√	√	√	√	√	√	√		
Polish	POLISH	√	√	√	√	√	√	√	√	√	√		
Polish two-pass	POLISH-T	√	√	√	√	√	√	√	√	√	√		
Mazowian	MAZOWIA	√	√	√	√	√	√	√	√	√	√		
Mazowian two-pass	MAZOW-T	√	√	√	√	√	√	√	√	√	√		
Latin 2	LATIN2	√	√	√	√	√	√	√	√	√	√		
Latin 2 two-pass	LATIN2-T	√	√	√	√	√	√	√	√	√	√		
Kamenicky	KAMENIC	√	√	√	√	√	√	√	√	√	√		
Kamenicky two-pass	KAMEN-T	√	√	√	√	√	√	√	√	√	√		
Turkish	TURKY	√	√	√	√	√	√	√	√	√	√		
Turkish two-pass	TURKY-T	√	√	√	√	√	√	√	√	√	√		
Cyrillic	CYRILIC	√	√	√	√			√	√	√			
IBM 437	IBM437	√	√	√	√			√	√	√			
IBM 851	IBM851	√	√	√	√			√	√	√			
ELOT 928	ELOT928	√	√	√	√			√	√	√			
Code Page DHN	PG-DHN	√	√	√	√	√	√	√	√	√	√		
Latin Polish	LATIN-P	√	√	√	√	√	√	√	√	√	√		
ISO Latin	ISO-LTN	√	√	√	√	√	√	√	√	√	√		

(Continued on the next page)

** Upright, italic, and bold available
√ : Supported

Resident font		Courier 10	Elite 12	Compress	Draft	Bold PS	Pica 10	Courier scalable **	Timeless **	Nimbus Sans **	Correspondence	OCR-B	OCR-A
National character set	Name in setup menu												
Lithuanian 1	LITHUA1	√	√	√	√			√	√	√			
Lithuanian 2	LITHUA2	√	√	√	√			√	√	√			
MIK	MIK	√	√	√	√			√	√	√			
Macedonian	MACEDON	√	√	√	√			√	√	√			
ABG	ABG	√	√	√	√			√	√	√			
ABY	ABY	√	√	√	√			√	√	√			
DEC Greek	DEC GR	√	√	√	√			√	√	√			
ELOT 927	ELOT 927	√	√	√	√			√	√	√			
GREEK 11	GREEK 11	√	√	√	√			√	√	√			
Code Page 862	PG 862	√	√	√	√	√	√						
Hebrew DEC	HBR-DEC	√	√	√	√	√	√						
Hebrew Old	HBR-OLD	√	√	√	√	√	√						
Code Page MAC	PG-MAC	√	√	√	√			√	√	√			
ISO Turkish	ISO-TUK	√	√	√	√	√	√	√	√	√	√		
RUSCII	RUSCII	√	√	√	√	√	√	√	√	√			
ISO8859-15	LATIN-9	√	√	√	√	√	√	√	√	√	√		
Windows Code Page 1250	WCP1250	√	√	√	√	√	√				√	√	
Windows Code Page 1251	WCP1251	√	√	√	√	√	√				√	√	
Windows Code Page 1252	WCP1252	√	√	√	√	√	√				√	√	

** Upright, italic, and bold available
√ : Supported

F

RESIDENT FONTS

This appendix provides print samples of the printer's nineteen resident fonts.

COURIER 10

The 24-wire dot-matrix printer prints quality characters and symbols using a variety of sizes and fonts.

PRESTIGE ELITE 12

The 24-wire dot-matrix printer prints quality characters and symbols using a variety of sizes and fonts.

DRAFT 12

The 24-wire dot-matrix printer prints quality characters and symbols using a variety of sizes and fonts.

COMPRESSED

The 24-wire dot-matrix printer prints quality characters and symbols using a variety of sizes and fonts.

PICA 10

The 24-wire dot-matrix printer prints quality characters and symbols using a variety of sizes and fonts.

CORRESPONDENCE 10

The 24-wire dot-matrix printer prints quality characters and symbols using a variety of sizes and fonts.

HIGH-SPEED DRAFT 12

The 24-wire dot-matrix printer prints quality characters and symbols using a variety of sizes and fonts.

BOLDFACE PS

The 24-wire dot-matrix printer prints quality characters and symbols using a variety of sizes and fonts.

OCR-B 10

The 24-wire dot-matrix printer prints quality characters and symbols using a variety of sizes and fonts.

OCR-A 10

The 24-wire dot-matrix printer prints quality characters and symbols using a variety of sizes and fonts.

COURIER (SCALABLE)

Normal

The 24-wire dot-matrix printer prints quality characters and symbols using a variety of sizes and fonts.

Bold

The 24-wire dot-matrix printer prints quality characters and symbols using a variety of sizes and fonts.

Italic

The 24-wire dot-matrix printer prints quality characters and symbols using a variety of sizes and fonts.

NIMBUS SANS ® (SCALABLE)

Normal

The 24-wire dot-matrix printer prints quality characters and symbols using a variety of sizes and fonts.

Bold

The 24-wire dot-matrix printer prints quality characters and symbols using a variety of sizes and fonts.

Italic

The 24-wire dot-matrix printer prints quality characters and symbols using a variety of sizes and fonts.

TIMELESS (SCALABLE)

Normal

The 24-wire dot-matrix printer prints quality characters and symbols using a variety of sizes and fonts.

Bold

The 24-wire dot-matrix printer prints quality characters and symbols using a variety of sizes and fonts.

Italic

The 24-wire dot-matrix printer prints quality characters and symbols using a variety of sizes and fonts.

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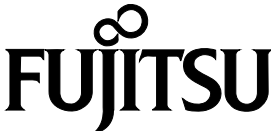
Fax: (81-24)574-2382
URL http://jp.fujitsu.com/group/fit/en/
Contact Email fit-gsm@cs.jp.fujitsu.com



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